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Historical record of The *Batticaloa Medical Journal*

I am privileged and honoured to be the Chief Editor of BMA 2013/14. *Batticaloa Medical Journal (BMJ)* is the official publication of Batticaloa Medical Association (BMA). The *Batticaloa Medical Journal* publishes original papers and commentaries which have relevance to medicine and allied sciences annually. It was first published in 2005 by BMA. After that, it was published annually for five years. Then Batticaloa Medical Society was unable to publish *Batticaloa Medical Journal*. After long period of time, this 6th volume of *Batticaloa Medical Journal* was published by Batticaloa Medical Association in August 2014. I hope that Batticaloa Medical Society will regularly publish *Batticaloa Medical Journal* in future.

Batticaloa Medical Society that was functioning for many decades as the forum for medical fraternity of Batticaloa district was renamed as Batticaloa Medical Association which was organized by a group of enthusiastic doctors in1972. With this milestone development the informal evening meetings turned into regular academic forums. Initially these forums are limited to case discussions by consultants and house officers and a day of joint programmes with other regional medical associations. The organizing committees have put great effort to create the knowledge-based atmosphere in many platforms such as lectures, continuous professional programs, workshops, presentations and scientific sessions. The Annual scientific session is the climax of all the events. The peaceful ground situation in year 2005 lead to introduction of many new activities in the annuals of BMA history. Regular two day annual scientific sessions initiated under the leadership of Dr. T. Rudra. He also paved way to the first official publication- *"Journal of Batticaloa Medical Association"* in July 2005. Five issues were published from this time up to now.

However, several steps were taken to improve our journal quality to standardize our journal in accordance with the uniform requirements for manuscripts submitted to biomedical journals developed by the International Committee of Medical Journal Editors this year .

We have formed the Editorial Committee consisting of Editor in Chief, Assistant Editor, Editorial Advisors and Statistical Advisor. We have also formed Reviewers Panel consisting of expert members in different fields of medicine and allied health sciences. We have also made author guidelines to submit the articles for *Batticaloa Medical Journal* under category "How to do it?" in *Batticaloa Medical Journal vol.6, August 2014.*

We publish articles related to medicine and allied sciences under following categories.

Leading articles Leading articles are solicited by the editors, and are expert opinions on current topics or commentaries on other papers published in the *BMJ.*

Review articles Review articles are usually commissioned. But the Editor encourages authors who would like to contribute, to discuss potential topics before submission.

Original papers Original research work concerning the causes, mechanisms, diagnosis, management and prevention of disease belong in this category. So do articles on health systems research, health economics and management, and medical ethics.

Case reports Acceptance of case reports is based strictly on originality and whether there is an important clinical lesson to be learnt from the report. Case reports may be accepted as contributions to the picture-story series.

Miscellany The *BMJ* will also consider for publication letters .These may be in response to a recently published article or a short free-standing piece expressing an opinion.

In addition we also consider specific articles under special category such as clinical audit, brief review, brief report and desk review after editorial board decision. All articles submitted anonymously to the Editorial Board and articles were assessed on the basis of importance of the research problem, scientific strength, clarity of presentation and appropriateness for readers of the *BMJ.* Editors reserve the right to modify style, shorten articles, make editorial corrections where necessary.

I sincerely thank all members of Editorial Board and Reviewers Panel who reviewed the papers for the success of this journal. I thank all authors who have contributed the articles to our journal.

I encourage all medical professionals including medical students, junior doctors, postgraduate trainees and senior doctors to submit articles for *Batticaloa Medical journal* in future time.

I hope that your valuable support will definitely improve unity, strength and scope of our *Batticaloa Medical Journal*.

Dr. (Mrs). Sureshini Rajendram MBBS, MD.
Editor in Chief / BMJ.

Glycaemic Index for healthy life of Sri Lankans

Arasaratnam V[1]

Batticaloa Medical Journal 2014; **6:** 3-11

Introduction

Glycaemic index measures the rate at which the carbohydrate in certain foods is digested and absorbed into the blood stream as glucose, i.e. the GI of a food represents its blood-glucose raising potential [1-5]. The Glycaemic Index according to FAO/WHO is defined as the incremental area under the blood glucose response curve of a 75g glucose equivalent carbohydrate portion of a test food expressed as a percent of the response to the same amount of glucose taken by the same subject [1,6].

During digestion, all carbohydrates are broken down glucose, which then enter the blood. As blood glucose level rises, the normal response of the body is to increase the level of insulin in the bloodstream. Insulin maintains the blood glucose level. The blood glucose level is usually maintained, unless a person has diabetes or he is insulin resistant.

Foods with a high glycaemic index raise blood glucose quickly (e.g. glucose), while with low glycaemic index (e.g. legumes) promote a slower release of glucose (and raise blood glucose slowly) and insulin. Diets with high-glycaemic index have been linked to an increased risk for both diabetes and heart diseases [7-8]**.**

What does Glycaemic Index offer?

The Glycemic Index

- reflects the physiological effect of foods,
- helps to keep blood glucose levels even,
- substitutes the old terms of complex and simple carbohydrates [9].

Glycemic Index (GI) ranks foods on a scale from 0 – 100, according to their actual effect on blood glucose levels [9]**.** On the Glycaemic Index scale, glucose is taken as 100 since it causes rapid rise in blood glucose while all the other foods are rated in comparison with glucose [10]. GI ranks foods based on their actual effect on blood glucose levels. If a food has a glycaemic index of 75, it means that it raises blood glucose by 75% when compared with glucose.

Foods with an index number of 70 or more are considered to be of high GI, with an index between 55-70 as medium GI, and 55 or less as low GI.

It has been proved that it is not the **amount** of carbohydrate, but rather **its rate of absorption and digestion** that determine the physiological response of the body [4]. It was previously thought that if same amount of carbohydrate is eaten (whatever that carbohydrate may be), it would have the same effect on the blood glucose levels. It is now known that the same amounts of different carbohydrate-containing foods have different effects on blood glucose levels. For instance, 30g of bread does not have the same GI as 30g of fruit or noodles.

Factors influencing the Glycaemic Index

The following factors influence the **digestion and absorption** of carbohydrates, and thus on blood-glucose levels, and hence affect the glycaemic index of the food [11]:

The amount and type of sugar

Pure glucose has a maximum effect on blood glucose, i.e. has high GI e.g. glucose syrup (used in cake/ confectionery manufacture), some sports drinks, and as 'dextrose' in many foods. Fructose occurs naturally in many fruits, some vegetables (corn, sweet potato), corn syrup, honey, etc.[12]. Fructose is absorbed as fructose and contributes very little to blood glucose levels because fructose must be converted into glucose by the liver. High fructose foods have a lower GI, and the greater the ratio of fructose (fruit sugar) to glucose in a food, the lower its glycaemic index [13].

Sugar (sucrose) has a lower index than bread or potatoes because sucrose is a disaccharide made up of both glucose and fructose, [14] and after digestion the blood glucose level is increased directly by the glucose and some amount is contributed by the fructose getting converted to glucose in the liver. However fructose can also be metabolized directly. If the glycaemic index of glucose is 100 and that of fructose is 23 then that of sucrose is the average of these two values, i.e.:

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100 (GI glucose) + 23 (GI fructose) / 2 = 61.5 (quoted as 65)

Lactose and sucrose have an intermediate effect on blood glucose levels. Therefore honey has an intermediate GI (58).

Degree of ripeness

Ripe fruits have higher sugar content than those which have not ripened, because during ripening large poly-saccharides are converted into sugars leading to a decrease in the time to digest (with some 40%) and, therefore, has a higher glycaemic index, e.g. the riper the food the higher the GI, e.g. yellow/black bananas vs. greenish bananas.

Type of carbohydrates

It has been noticed for a long time that two carbohydrates (or poly- saccharides) with the same molecular weight but with different structure may be digested differently.

The Chemical composition of the starch

If there is more of the branched starch (amylopectin) and less of the unbranched chains (amylose), digestion will be quicker [15]. Starches, such as rice, can have different types of starch structures, which affect their digestibility. Among the rice available in Sri Lanka BW 400 red varieties showed lowest GI of 27.5 and BW 2726-B (parboiled) showed the highest value of 42.9[16]. Some types of rice such as Basmati have higher amylose content. Other rice, with higher amylopectin content, is much easier to digest and has a higher GI. Beans and pulses have mostly amylose and are digested slowly. The starch in potatoes, for example, is digested and absorbed into the bloodstream relatively quickly.

Fibers

Fibers are "those carbohydrates that are not digested by human enzymes in the small intestine". Fibers shield the carbohydrates in food from immediate digestion, so the sugars in fiber-rich foods tend to be absorbed into the bloodstream more slowly. Soluble fiber slows down the digestion of starches and the absorption of glucose into the bloodstream, e.g. fruit pectin and legume fiber (beans, lentils etc.) [17]**.** Further the foods containing soluble fiber have a lowering effect on the GI because they delay gastric emptying. Insoluble fiber such as that found in digestive bran has very little effect on the digestibility of the carbohydrate foods it is found in. But, in very large amounts, bran can lower the GI.

The fat and protein content

Stomach is emptied slowly if the food contains high amounts of protein and fat. The higher the fat content of foods the slower its carbohydrates are converted to sugar and absorbed into the bloodstream. As they take longer to digest they have a lower GI. Fat also slows the absorption of a meal. However, it is not advisable to eat too much protein or fat. Protein tends to wear out the body's insulin; and fat has the effect of decreasing the effectiveness of insulin. Protein also overtaxes the kidneys and an over-consumption thereof can lead to osteoporosis, arthritis and gout.

The methods of food preparation and processing

Milling, blending, mixing, mashing and refining foods raise the GI of foods. That is why it is recommended to limit beating, liquidizing or processing in recipes. One of the most important factors in increasing GI is the degree of processing of carbohydrates. In highly processed carbohydrates, the outer bran and inner germ layer are removed from the original kernel of grain, which causes bigger spikes in blood sugar levels than would occur with less-processed grains. Foods, which are more processed, digested quicker and have a higher GI, e.g. instant potato, refined cereals. Processing makes the starch faster to digest. Whole-grain foods tend to have a lower glycaemic index than their more highly processed counterparts.

Degree of starch gelatinisation

Gelatinisation of starch occurs when the starchy food is exposed to water and heat (i.e. cooking in aqueous medium). Water binds with starch (e.g. flour) in the presence of heat and gelatinises the flour. The heat and water expand the hard compact starch granules (which make the raw starch difficult to digest) into swollen granules. Some granules even burst and free the starch molecules. The less a starch is gelatinised, the slower it is digested and absorbed. In other words, it will have a lower GI.

Many confectionery items that contain sugar have a lower GI than those without! If sugar is added, the sugar binds with the liquid, preventing it from binding with the starch and thereby preventing gelatinisation.

Particle Size

Finely ground flour has a higher glycaemic index than more coarsely ground flour. Intact grains such as whole wheat, whole corn and whole rice have a much lower GI value than flours made from the same grains.

Degree of processing

The more processed/refined a food is, the higher the GI. Foods, which are more, textured, chewy, crunchy, fibrous tend to take longer to be digested and release their glucose into the blood stream more slowly than soft, refined or pre-cooked foods. Long grain white rice has a lower GI than quick cooking brown rice and multigrain bread has a lower GI than whole meal bread [16].

Cooking method

Cooking methods such as frying, boiling and baking, all affect GI rating. The method of baking bread appears to influence its GI; traditional slow rising bread dough can have a lower GI than breads made with rapid-rise dough.

Cooking time

Briefly boiled rice, 1 minute, may result in twice the time to digest as compared to 6 minutes boiled rice.

Others

Anti nutrients

Phytates, lectins and polyphenols (tannins) normally slow digestion and thereby decrease the GI.

Acidity

If an acidic food is added to a meal, this will lower the GI, e.g. by adding dressing to a salad, digestion of food by the stomach is made more slow. The higher the acid contents of a food, the slower its carbohydrates are converted to sugar and absorbed into the bloodstream. The more acidic a food, the lower is the GI of that food, e.g. addition of lemon juice to vegetables, vinaigrette dressings on salad, pickled foods, increasing the acidity of bread by using sour dough fermentation. Another example is, a green apple will have a lower GI than a yellow Golden Delicious Apple [18].

Speed of eating

Studies have shown that blood-glucose levels rise less rapidly when eating more slowly. Food that has not been properly chewed also has a lower GI – it may also lead to indigestion.

Salt

Salt and salty foods/condiments tend to speed the rate of digestion of starches and increase the rate of absorption of glucose and increases the GI of the meal.

The Glycaemic Index of a food depends on many factors including harvest time, gene species, age of food, type of processing, nutritional profile, and many other variables. New potatoes have lower GI than desire potatoes and long grain rice lower GI than short grain rice.

Combination of foods in mixed meals

Often the GI of a given food is not what one would expect, e.g, the GI of brown bread is 70 whereas sweetened, low-fat fruit yoghurt is only 33. For this reason, all foods containing carbohydrate need to be tested to determine their GI. Eating proteins rich food in a meal lowers the overall GI of the meal. Rice with meat sauce has a lower GI than rice with tomato sauce [19].

Glycaemic Index versus Glycaemic Load

If foods with low GI are eaten, the blood sugar levels will remain more stable. But when low glycaemic index foods are chosen and eaten too many of them at once, that is, if a meal with a high glycaemic load is eaten, the blood sugar will still rise dramatically and excessive amounts of insulin is required to deal with it. The blood sugar levels will not be nearly stable enough because the insulin index of the meal is too high [20, 21]. The Insulin Index is a relatively new concept, which measures the amount of insulin the body produces in response to a set carbohydrate load of a particular food [22, 23].

Which is more important, is glycaemic index or glycaemic load?

The glycaemic load of a meal has a much greater effect on its insulin index than its glycaemic index, so the total amounts of carbohydrates that are consumed control blood sugar levels [24, 25]. If high glycaemic indexed carbohydrate foods are chosen, and if small amount of them is eaten, the blood sugar will be under control. Thus eating a small amount of carbohydrates with high GI is not unhealthy, while, too much of carbohydrates with low GI are still bad. Carrots have very high GI. But, a small amount of carrot eaten with other foods will not significantly elevate insulin levels. If a meal consisting of half a kilo of carrots is eaten, the insulin levels will be elevated.

Sucrose is a good example of the difference between glycaemic response and insulin response. Sugar (sucrose) is insulinogenic (meaning it elevates insulin), but the insulin-stimulation caused by ingesting sugar is greater than its GI would indicate. When dietary fat is added to sugar, the combination of fat and sucrose

produces a mild glycaemic response, but with a powerful fat-storing insulin response [26].

Though low GI foods do not stimulate fat-storage as efficiently as high GI foods, they still contain calories. If a person continuously eats food with 4,000 kcal per day and with low or high GI and do not exercise, then he will become over weight.

To effectively control the blood sugar levels it is important to eat both suitable types and amounts of carbohydrates. Therefore it is necessary to eat meals with a low GI and a low glycaemic load. Only then the need for insulin can be reduced, and can reap health benefits that we are striving for. Choosing foods with a low GI and low insulin index can improve diabetic management and may possibly reduce the incidence of diabetes complications e.g. heart disease, renal disease [27, 28].

Significance of Glycemic Index

All foods with a GI of 50 or less are slow releasers of carbohydrates and are the best choices for inactive people, the overweight, sportsmen one [29] or two hours before exercise [30], as well as diabetics, hypoglycaemics and persons with high triacylglycerols [31]. Therefore, low-GI foods also prevent the huge drop in blood-glucose, which occurs after the initial rapid rise in blood-glucose levels, which usually happens after eating high-GI foods.

Intermediate GI foods are those with a GI of between 50 and 70. They are the best choice after low-intensity exercise of short duration, in the morning after exercising the previous night and directly after moderate activity in diabetics.

Foods with a GI of 70 and higher are called high-GI foods [32, 33]. High-GI foods are excellent for the prevention of fatigue and hypoglycaemia in regular sportsmen after doing moderate to high-intensity exercise. High-GI foods should, however, be limited by diabetics under normal circumstances, but are completely safe after strenuous exercise lasting two to three hours [32].

High GI foods elicit a huge insulin response, the body's way of coping with the sudden, sharp rise in blood-glucose. Often this insulin response is too much and blood-glucose levels then rapidly fall to below the starting point, a condition known as hypoglycaemia.

- Low GI means a smaller rise in blood sugar and can help to control established diabetes [33, 34].
- Low GI diets can help people to lose weight and lower blood lipids [29, 35, 36]
- Low GI diets can improve the body's sensitivity to insulin
- High GI foods can help to re-fuel carbohydrate stores after exercise [37].

Low GI foods

* best for most people, most of the time because they reduce the risk of disease
* are the most satiating (hunger satisfying), reduce appetite and help reduce overeating [38]
* help people with diabetes to control their blood sugar levels.
* help to reduce blood insulin levels and so reduce the undesirable effects of insulin resistance (e.g. coronary heart disease, obesity and type 2 diabetes.)

The GI tells us which foods make us store fat and which don't. Low-Gl diets offer a unique set of benefits. They

* do not stimulate fat storage
* enhance sports performance
* improve energy levels while reducing sugar-related energy and mood swings
* improve muscle to fat ratio
* enhance mental alertness
* may help to lower blood lipids

How to use the Glycaemic Index?

Look at foods that were eaten currently. Then work out ways to replace high GI foods with low GI alternatives, but it should be noted that the amounts (grams) of carbohydrate must be kept the same. The total amount of carbohydrate, the amount and type of fat, and the fiber and salt content of food are also very important. Why? Because foods high in fat often have a low GI. However, a high fat diet is not recommended for overweight people or people with diabetes [39].

Ten simple ways to change to a low GI diet

- The best way is to include one low GI food at each meal.
- Switch to breakfast cereals based on wheat and rice with bran (such as porridge).
- Eat grainy breads made with whole seeds, barley and oats, instead of white or brown bread.
- Eat long-grain rice in place of short-grained rice, but watch serving size.
- Use fat-reduced milk and low-fat yoghurt.
- Eat pulses and legumes (such as beans, lentils and peas).

- Eat legumes and green leafy vegetables in preference to other starchy vegetables.
- Favour apples, grapefruit, grapes, orange, pears, and under-ripe bananas in preference to other fruits.
- Favour less processed foods and foods that aren't over cooked, as processing and cooking makes food easier to digest.
- Eat fibre because it helps slow the digestion and absorption of carbohydrates.

Choose most vegetables without even thinking about their GI. Essentially, low GI eating means high carbohydrate foods that are staples in many parts of the world with an emphasis on whole foods such as the whole grains and legumes or pulses.

Problems in practicing GI

1. GI values of all foods are not known.
2. Foods are not eaten as varied meals.
3. The GI varies for different brands of the same product
4. The GI does not relate to the nutritional value of a food.

Jaffna foods and their Glycaemic Index

Form our recent studies the GI values obtained for the locally available foods were determined [40-47].

Glycemic Index of different varieties of rice [40, 42]

The glycaemic index (GI) values of cooked white rice, brown rice and parboiled rice were 66.61 (±9.86), 60.24 (±8.16) and 55.97 (±6.01) % respectively (Table 1). When fiber contents of the three cooked rice varieties were considered the cooked parboiled rice contained more soluble dietary fibers (0.42%), insoluble dietary fibers (1.88%) and total dietary fibers (2.3%), than the cooked brown rice (0.21, 1.88 and 2.09%) and cooked white rice (trace, 1.21 and 1.21%). The available carbohydrate in the foods for absorption might be made unavailable due to its soluble dietary fibers (SDF), insoluble dietary fibers (IDF) and total dietary fibers (TDF) contents. The monosaccharaides released by the hydrolysis and available for absorption might be made unavailable. This could be due to the tendency of the fibers to absorb sugars and absorbed sugar released slowly. A soluble fiber slows down the digestion of starches and absorption of the glucose in to blood stream. The total dietary fiber content of cooked parboiled rice was higher than that of the other cooked rice. When the insoluble dietary fiber is considered, the cooked parboiled rice contained same amount (1.88%) and the cooked white rice contained lower (1.21%) than other varieties. However the total dietary fiber contents of cooked parboiled rice and brown rice varieties were closer to each other. Thus the parboiled rice variety is a better choice for the diabetics and coronary heart disease patients.

Table 1: Glycemic Index values of different varieties of rice commonly eaten by Jaffna inhabitants.

Rice	Glycemic Index(%)
Parboiled	56.00
Sampa	66.60
Polished (At-402)	60.20

Food items prepared from rice flour [41, 43]

The mean glycemic index values of 'Pittu' and 'string hopper' were 43.74 (±9.09) and 50.01 (±7.06) % respectively (Table 2). When the fiber content of 'pittu' and string hopper were considered 'pittu' contained more soluble dietary fibers than (0.45%), insoluble dietary fiber (1.56%) and total dietary fiber (2.01%) and string hopper contained soluble dietary fibers 0.43%, insoluble dietary fiber 1.45% and total dietary fiber 1.88%. The total dietary fiber of 'pittu' was higher than that of string hopper. 'piitu' and string hoppers are made out of roasted rice flour and steamed wheat flour. When the rice flour is roasted heat might have initiated the Mailard reaction and caramelization. With steaming the starch exposed to moist heat may undergo gelatinization and subsequently they may have retrograded causing a lowering effect on glycemic index. This might be the reason for the lower glycemic index values for 'pittu' and string hoppers when compared with cooked rice.

Table 2: Glycemic Index values of String hopper and 'pittu' prepared from rice flour and wheat flour in1:2 ratio.

Foods	Glycemic Index(%)
String Hoppers	50.00
Pittu	43.70

Effect of side dishes on Glycaemic Index [42]

The mean GI values of parboiled rice ('*Mottaikarupan'*), *'kurakkan pittu'* (*Eleucine coracana*) and *'atta pittu'* (whole wheat grain flour) either with green leaf curry (*Amaranthus*) or gravy (soya meat) or green leaf curry and gravy were determined (Table 3). The GI of parboiled rice or *'kurakkan pittu'* or *'atta pittu'* with green leaf curry differed significantly ($p<0.05$) from other

combined foods. The GI of parboiled rice or *'kurakkan pittu'* or *'atta pittu'* with gravy or green leaf curry and gravy did not differ significantly ($p>0.05$) among them. *'Kurakkan pittu'* is inferior to *'atta pittu'* and parboiled rice. Including curries to basic foods altered the GI. Therefore, when dietary advice is given to diabetic patients, not only the basic foods, but also the curries to be consumed have to be considered. From the findings it could be concluded that among the starch sources 'atta flour' pittu was the best followed by parboiled rice. Even though we have had believed that 'kurakan' and its flour are good starch based diets for diabetics and CVD patients, and obese and overweight persons. The results indicated that the foods made out of 'kurakan flour should not be recommended for diabetics.

Table 3: Glycemic Index values of rice and 'pittu' prepared from rice flour and wheat flour; 'kurakan flour' and 'atta'flour with different side dishes.

	Foods	Glycemic Index(%)
Parboiled rice	Green leafy curry	47.50
	Gravy	56.30
	Green leafy curry and gravy	54.70
	Rice flour and wheat flour-1:2 ratio	43.70
Pittu	Kurakan flour	
	Green leafy curry	57.50
	Gravy	63.30
	Green leafy curry and gravy	59.30
	Atta flour	
	Green leafy curry	44.40
	Gravy	50.80
	Green leafy curry and gravy	46.30

Glycemic Index values of some tubers and legumes [43]

The glycaemic index (GI) values of cassava (*Manihot esculenta*), potato ((*Solanum tuberosum*, Nuwara Elia), boiled green gram (*Vigna radiata*) and chick pea (*Cicer arietinum*) were determined (Table 4).

When boiled potato or cassava, which contained 75g digestible carbohydrate, was administered to the volunteers the peak blood glucose level was obtained at 30 min. The mean glycaemic index values of potato and cassava were 65.2 (±6.56) and 78.7 (±7.3%). When the fiber contents of boiled potato and cassava are considered, the soluble dietary fiber (0.48%, 0.47%), insoluble dietary fiber (1.21%, 2.18) and total dietary fiber (1.69%, 2.65) respectively. the mean glycemic response to boiled potato and boiled cassava were 40.8 (±4.11) and 49.3 (±4.57) mg dl^{-1} respectively. These values could not be due to the effect of soluble dietary fiber or insoluble dietary fiber in these two food items. Because the boiled potato and cassava contained almost same amount of SDF and the boiled cassava contained higher IDF than boiled potato. Hence the fiber content did not affect the glycemic response of boiled potato and boiled cassava. Cooking also has shown to exert a differential effect on GI of a carbohydrate – rich food, particularly one that is high in starch. In the boiled and cooled potato the processing could have formed the resistant starch. Thus the variation in the glycaemic index of boiled potato from boiled cassava could be due to more resistant starch formation in during boiling and cooling of potato and cassava. Thus cassava is a high GI diet.

When boiled green gram or chickpea, which contained 75g digestible carbohydrate, was administered to the volunteers the peak blood glucose level was obtained at 60 min. The mean glycaemic index values of boiled green gram and boiled chickpea were 31.4 (±6.96) and 33.3 (±6.23%). When the fiber contents of boiled green gram and chickpea are considered, the soluble dietary fiber (0.43%, 0.4%), insoluble dietary fiber (8.8%, 7.2%) and total dietary fiber (9.2%, 7.6%) respectively. The mean glycemic response to boiled green gram and boiled chickpea were 19.7 (±4.36) and 20.8 (±3.9) mg dl^{-1} respectively. Boiled green gram contained more soluble dietary fibers, insoluble dietary fiber and total dietary fiber than chickpea. Due to higher fiber content of boiled green gram and chickpea the glycemic response was delayed ad were less. Boiled green gram and chickpea are low GI diets and are good for diabetic and coronary heart disease patients.

Table 4: Glycemic Index values of different foods commonly eaten by Jaffna inhabitants.

Boiled Foods	Glycemic Index(%)
Potato	75.20
Cassava	78.70
Chick pea	33.30
Green gram	31.40

Glycemic Index values of some bakery products [44, 45]

The glycemic index of the bakery products such as bread, normal bun, butter cake, hard bun, and rusk available in Jaffna was determined (Table 5).

When fiber contents of the bread and normal bun were considered, bread contained less soluble dietary fiber (0.5%) and more insoluble dietary (2.73%) and total dietary fibers (3.23%), than the normal bun (0.56, 2.43 and 2.99% respectively). The SDF, IDF and TDF of wheat bread and normal bun did not show much difference. Even though, bread contains higher IDF, the mean glycaemic response to bread is higher (43.0 ±2.32gL^{-1}) than the normal bun (42.2 ±3.15gL^{-1}). It could be due to the less amount of SDF in wheat bread.

When fiber contents of the normal bun and hard bun were considered, hard bun contained more soluble dietary fiber (0.76%), insoluble dietary fiber (2.99%) and total dietary fibers (3.75%), than the normal bun (0.56, 2.43 and 2.99% respectively). The mean glycaemic response to normal bun (42.2 ±3.15gL^{-1}) is higher than the hard bun (33.1±3.39gL^{-1}). This could be due to the effects of SDF, IDF and TDF in these buns.

The soluble dietary fiber (0.6%), insoluble dietary fiber (2.57%) and total dietary fibers (3.17%), of butter cake were higher than the bread and normal bun. The mean glycaemic response to butter cake was 40.5 (±4.03gL^{-1}) and this was lower than those of bread and normal bun and this could be due to the higher dietary fiber content while the fat content did not influence.

Table 5: Glycemic Index values of different bakery products.

Bakery Products	Glycemic Index(%)
Wheat Flour bread	68.59
Normal Bun	67.30
Hard bun	52.78
Butter cake	64.72
Rusk	50.30
Malted rice-wheat bread	62.00

Rusk contained more soluble dietary fiber (0.87%), insoluble dietary fiber (3.18%) and total dietary fiber (4.05%) than other bakery products. Among all the bakery products, rusk gave the lowest glycaemic response (31.1 ±3.03mgdL^{-1}). Here the soluble dietary fiber highly influenced the glycaemic response than insoluble dietary fiber.The hard bun and rusk are lower GI diets (GI values < 55%). Bread, normal bun and butter cake are medium GI diets (GI values between 55-70%).

Glycemic index of the wheat flour bread and malted rice-wheat bread [47] were studied [46]. The peak glycemic response of malted rice-wheat bread [38.8 (±4.8)gL^{-1}] was obtained at 30min and the mean GI value was 62.0 (±7.67)%. Thus it had lower GI value than the wheat bread. This could be due to the higher SDF, IDF and TDF contents of malted rice-wheat bread.

Glycemic Index values of some fruits [47]

This glycemic index (GI) values of fruits such as 'Kathali' (Yellow plantain), 'Kappal' (Golden plantain), and 'Itharai' (Green plantain) varieties of plantains, jackfruit and papaya were studied. The mean GI values of the 'Kathali', 'Kappal', 'Itharai' varieties of plantains, jack fruit and papaya were 54.45 (±9.26), 50.43 (±5.79), 48.47 (±10.13), 65.36 (±8.00) and 34.80 (±12.78) % respectively. The three varieties of plantains and papaya were low GI fruits, and jackfruit was found to be an intermediate GI fruit. The presence of dietary fiber, esp. soluble fiber, reduces the glycemic response and glycemic index of foods. Thus among the different types of plantain varieties, ripped 'ithari' is best followed by kappal. However among the fruits, papya is the best followed by 'Ithari' variety of plantain.

Table 6: Glycemic Index values of different fruits.

Fruits	Glycemic Index(%)
Plantain 'Kappal'	54.5
'Kathali'	50.4
'Itharai'	48.5
Papaya fruit	34.8
Jack fruit	64.4

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Evolution of breast feeding practice - Are we doing better?

C Gadambanathan[1]

Batticaloa Medical Journal 2014**; 6:** 12-16

Introduction

Breast milk (BM) is a unique product given to the human being by nature to fulfill all requirements of the offspring until it is mature enough to take adult food. Its uniqueness lies in the ability of the mother to produce milk which will vary in quantity, quality and consistency depending on the age of the baby, maturity and timing of the feed. It has not been possible to achieve this with any other type of milk, even with state-of-the-art modifications using the most advanced technology. BM not only provides easily digestible and specifically needed amounts of nutrients, water, minerals and vitamins but also several other benefits to both mother and Babies [1, 2, 3].

Benefits to the baby;

1. Reduces infections through "priming" of the baby's immune system. Specifically diarrhoea due to E-coli, Rotavirus, Shigella, Campylobacter etc.
2. Reduces incidence of respiratory tract infections, risk of allergies,and bronchial asthma.
3. Reduces late onset sepsis in low birth weight (LBW) babies.
4. Effect on better neurodevelopment.
5. Reduces risk of sudden infant death syndrome
6. Provides analgesia to the baby during painful procedures.
7. Reduces the non communicable diseases like type I diabetes mellitus, hypercholesterolaemia, hypertension and obesity.

Benefits to the mother;

1. Reduces postpartum bleeding
2. Reduces menstrual blood loss
3. Helps with child spacing attributable to lactational amenorrhoea
4. Reduces obesity
5. Reduces risk of breast cancer and ovarian cancer
6. Promotes bonding between mother and baby
7. Convenience of feeding the baby on demand

Breast feeding practice in Sri Lanka

Sri Lankan model on promotion of breastfeeding is based on two key aspects of health care following world trend. These two are;

1. Baby Friendly Hospital Initiative (BFHI)
2. Establishment of mother & baby centre

Baby Friendly Hospital Initiative (BFHI)

The **Baby Friendly Hospital Initiative** (**BFHI**) is a worldwide programme of the World Health Organization and UNICEF, launched in 1991 following the adoption of the *Innocenti Declaration* on breastfeeding promotion in 1990. This ten step initiative is a global effort for improving the role of maternity services to enable mothers to breastfeed babies for the best start in life.

Ten steps of BFHI:

- Have a written breastfeeding policy that is routinely communicated to all health care staff.
- Train all health care staff in skills necessary to implement this policy.
- Inform all pregnant women about the benefits and management of breastfeeding.
- Help mothers initiate breastfeeding within one hour of birth.
- Show mothers how to breastfeed and maintain lactation, even if they should be separated from their infants.
- Give newborn infants no food or drink other than breast milk, not even sips of water, unless medically indicated.
- Practice rooming in - that is, allow mothers and infants to remain together 24 hours a day.
- Encourage breastfeeding on demand.
- Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
- Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

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It aims at improving the care of pregnant women, mothers and newborns at health facilities that provide maternity services for protecting, promoting and supporting breastfeeding, in accordance with the International Code of Marketing of Breast milk Substitutes [3,4,5].

Lactation Management Center (LMC) and Mother – Baby Unit (MBU)

Lactation management centre (LMC) is the brainchild of Dr. Anoma Jayathilake, then a Consultant Community Physician at the Family Health Bureau (FHB) and currently the National Professional Officer, World Health Organisation (WHO). The concept of mother-baby units and LMCs was planned and received Health Ministry approval in 2007[6]

By definition, LMC is a part of the mother-baby unit and addresses mainly problems of BF. It functions as a day-care centre whereas babies who need overnight stay are admitted to mother-baby units. In Sri Lanka, the first LMC was started at CSHW, Colombo in the year 2000 and is running successfully to date. The second LMC was opened at General Hospital, Kandy in June 2006 [6, 7].

Services provided

- ❖ Offers a relaxed environment
- ❖ Monitoring weight gain
- ❖ Correcting techniques of breast feeding
- ❖ Advice on special problems e.g. sore nipple
- ❖ Teaching mothers on spoon feeding, expressing milk, back massage, Kangaroo Mother Care
- ❖ Advice on top up feeding when necessary – in case of artificial feeding advice from Senior MO/ Paediatrician is obtained.

Duties of LMC Staff

- Daily ward rounds in postnatal wards
- Special attention to mothers who had feeding problems
- in the previous night (Notification book is maintained)
- Visiting mothers' in ICU/CCU on request
- Attending mothers' who directly come to LMC
- Answering telephone inquiries and advice
- In service programs to train hospital staff
- Educational programs to parents-to-be at antenatal clinics
- Maintenance of registers with statistics, sending monthly returns to FHB

Current statistics related to neonates and breast feeding (BF) in Sri Lanka [8,9,10] reveals

- o Percentage of babies' breast fed within the 1st hour of age: 85%
- o Percentage of babies exclusively breast fed from 0-1 month: 92.6%
- o Percentage of babies exclusively breast fed up to 3 months: 85.1%
- o Percentage of babies exclusively breast fed up to 4-5 months: 53.5%

It is pertinent to note that percentage reduction of infections in neonates by exclusive breast feeding (EBF) as a single intervention is known to be around 22% [2, 6]

Ninety percent of births in Sri Lanka take place in institutions. Mothers get satisfactory support and advice about exclusive breastfeeding in most of the health facilities. As the figures given above indicate that the percentage of mothers who continued to breast feed exclusively go down with the age of the baby, it is important to look for possible causes of this phenomenon [11,12,13].

Some possible reasons are:

- ➢ Issues with Breast Feeding are not often identified as serious medical problems to get professional advice. Input given by elders, neighbours and friends play a key role.
- ➢ Spending time in busy clinics and queues is practically difficult for the mother and baby
- ➢ Confusing advice is sometimes given by our own health staff.
- ➢ More nuclear families are seen in our society today. Mother may not get adequate support for BF when needed.
- ➢ Books and reading material do not provide solutions to every feeding problem.
- ➢ multi-national milk food companies are providing an easy alternative to a mother who encounters even a small problem with BF.
- ➢ Common myths such as frequent crying indicate inadequate amount of BM etc. which lead mothers to decide on adding artificial feeds to baby's diet.

Changes at Teaching Hospital, Batticaloa (2008-2014)

Teaching Hospital /Batticaloa is the tertiary care hospital in the Eastern Province. There are three obstetric units cared by Consultant Obstetricians. There are 500 – 600 deliveries occur monthly. From the time of initiation many steps were taken to enhance breast feeding practices

Key steps taken to strengthen breast feeding practices in THB

1. Teaching Hospital , Batticaloa was declared as a baby friendly hospital
2. Established "Mother Baby Center" – Mother Baby Unit with Lactation Management Center
3. Formed a committee to Promote, protect & support breast feeding.
4. Established spaces for breast feeding purpose at OPD and Paediatric clinic.
5. Provided training to staff - Medical officers, Nursing staff, Midwives who are working with mothers and babies.

Mother – Baby unit and LMC was started at Teaching hospital Batticaloa, by Consultant Paediatrician Dr. Shanthini Ganeshan in March 2008. Now the MBU has 10 low, wide beds to support "Bedding in" practice to improve breast feeding [14, 15].

At present, Lactation Management Centre (LMC) operates from 7 AM -1 PM daily, with the single trained nursing officer and a supportive medical officer from MBU. Nursing officer plays a major role in the day to day functioning of this centre which is supporting mothers needing encouragement and advice on breastfeeding. 848 mothers benefitted from services offered at lactation Management Centre in 2013 (Figure 1for monthly attendance at LMC). Most of these mothers were referred by hospital itself (Figure 2). Information about LMC is provided through rubber stamp designed for this purpose (Figure: 3).

Figure 1:Monthly attendance at LMC in 2013.

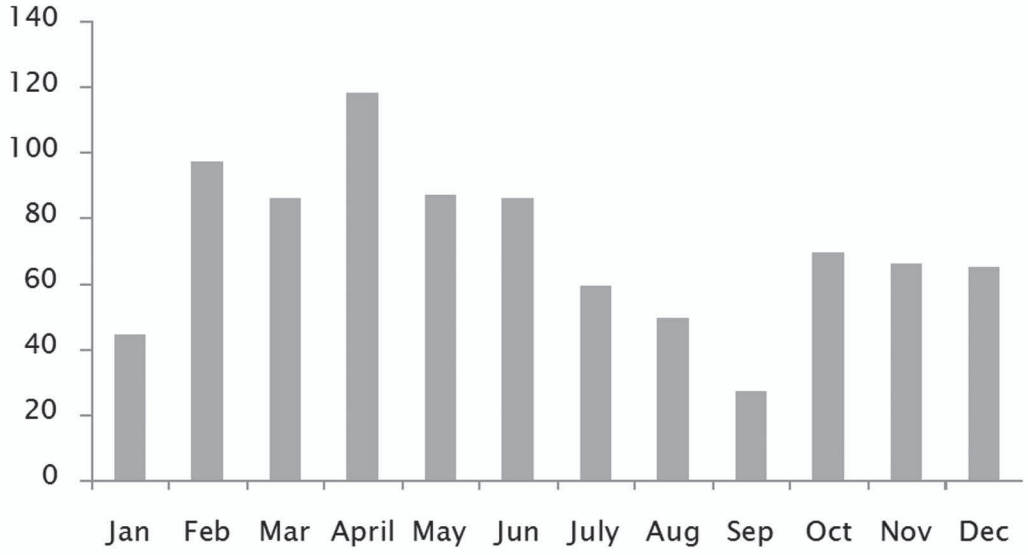


Figure 2 :Sources of referral to LMC

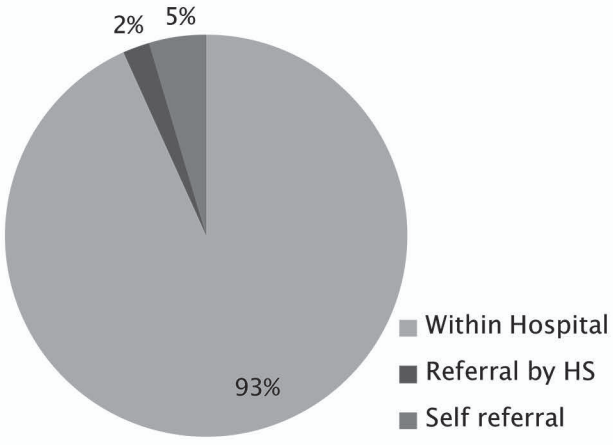
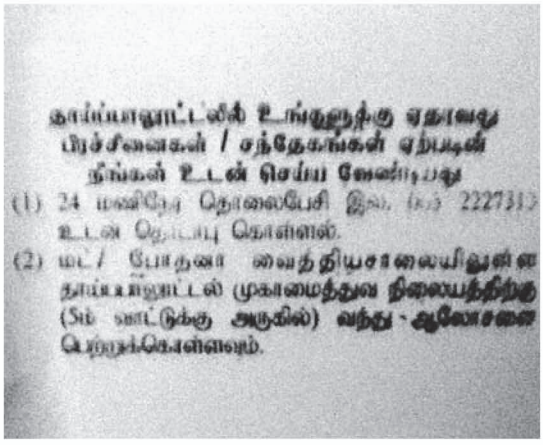


Figure 3:Information about LMC



Reserved spaces for breast feeding mothers were established in the Out Patient Department (OPD), Paediatric clinics to encourage the breast feeding practice with the support of International Lions Club foundation in 2012. These spaces are currently used by 10-15 mothers attending to OPD and clinics on a daily basis.

Training of staff attached to THB and primary health care system from Batticaloa district were trained on Essential newborn care course (ENCC), Baby friendly hospital initiative (BFHI) course in Tamil medium. These training programmes were supported by Family Health Bureau and UNICEF.

Challenges on promotion of breast feeding practice

There has been great improvement in the attitude and practice with regard to breast feeding practice. The following have been still remaining as key obstacles

1. Inadequate space at Post Natal Unit.
   At present, a common post natal unit accommodates all mothers after delivery and the space is grossly inadequate. Mothers need to share the bed and face difficulties to practice breast feeding in post natal unit.
2. Inadequate staff at Lactation Management Centre
   Currently a single trained nursing officer supports on shift basis (7AM- 1PM). There is a need for an additional Midwife / Nursing Officer to improve the service and to extend the service hours.
3. Lack of regular training
   It's a difficult task to train all the staff who provide care to mothers and babies. Regular frequent training is essential to update the knowledge of staff.
4. Low level of coordination
   Coordination between the hospital and primary health care staff is very important to maintain the exclusive breastfeeding practice. Lack of regular mechanisms in the sector still remain a formidable challenge
5. Lack of training in private sector.
   All the trainings are provided to staff attached to government sector. Quite a significant number of deliveries are attended in private sector and the staff attached to these hospitals will be benefitted if there is a inclusive training programme

Hopes for future

There are lots of initiatives and plans already at different stages of processing and planning once completion of these programmes and projects, breast feeding practices will be further enhanced with the benefits to mothers and children of future. The following are few of these initiatives in the pipeline awaiting completion.

Most important among this is the establishment a maternal & neonatal complex with the adequate space and resources.

Mothers and new born babies attending to Teaching hospital, Batticaloa will be certainly benefitted by extension of space of the LMC with adequate resources with extended service hours. Regularization of training programmes on ENCC and BFHI to staff in all levels of health care including those working in the Private sector on Essential newborn care course (ENCC), Baby friendly hospital initiative (BFHI) not only improve staff capacity but also promote breast feeding practices of mothers.

Creation of local mechanisms to facilitate transfer of care of babies from tertiary / secondary care staff to the Primary health care staff will certainly help to maintain breast feeding practices into the community.

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Study on tuberculosis in relation to clinical patterns, clinico pathological parameters and cytohistological features

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(Key words: Tuberculosis, Diagnosis, Histopathology)

Abstract

Objective To describe the clinical patterns of tuberculosis in a tertiary center and to study the clinico pathological parameters namely clinical pattern, AFB positivity, ESR and Mantoux in relation to cyto histological features in a tertiary center.

Methods A descriptive retrospective study was done in 260 cases which had been assessed cyto histologically and diagnosed as tuberculosis at the Department of Pathology, National Hospital of Sri Lanka in a period of one year from 1st January 2006 to 31st December 2006. The second part was a prospective study. A total of 91 patients who had features of tuberculosis in cyto histological specimens were included in this study. Apart from routine H&E stain, Ziehl Neelsen stain was performed in all the cases and ESR, Mantoux values and the detail of clinical presentations were collected and assessed against the cyto histological features during a period of six months from April to September 2007.

Results Out of 260 cases 53.07% were tubercular lymphadenitis and 18.07% were tuberculosis of the pleura. The second part of the study also has reflected an identical clinical pattern. Other unusual presentations observed were breast lump, scalp lytic lump, swelling in the thyroid region, subcutaneous tuberculosis in the form of cheek lump, fore arm lump, thigh lump, chest wall lump, tuberculosis of the middle ear, shoulder joint tuberculosis and tarso meta tarsal joint of the great toe. Out of 91 cases 43.95% showed high ESR. Mantoux positivity was seen in 73.62% of the cases and 51.64 % of cases were AFB positive. Caseation was commonly found in tuberculous lymphadenitis whilst pleural effusion was manifested as histiocytic granuloma. 67.5% of cases with high ESR (>70mm/1st hour), 71.64 % of cases with positive Mantoux test and 80.85 % of cases with positive AFB showed caseation. The correlation with caseation and AFB positivity was found to be statistically significant.

Conclusions Tuberculous lymphadenitis was the major clinical presentation identified in this study with the cervical nodes being the commonly affected lymphnode group. Amongst this the deep cervical lymph node was frequently involved by the tuberculosis.

Isolated breast lump, scalp lytic lump, swelling in the thyroid region, subcutaneous lumps, TB of the shoulder joint, swelling of the tarso meta tarsal joint of the great toe and middle ear tuberculosis were the atypical presentations identified in this study.

Majority of the cases especially the tubercular lymphadenitis have been diagnosed at 6 -8weeks of the infection with formation of caseation and multinuclear giant cells. Whereas pleural tuberculosis has been detected at the early, at the only granulomatous stage.Statistically significant correlation was found between caseation and AFB positivity. High proportion of mantoux positivity, high ESR and AFB positivity were seen at the late stage of the disease (6-8weeks). Therefore the only means of diagnosis at an early stage of infection is cyto histological assessment of the appropriate specimen.

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Introduction

There is a world wide resurgence of tuberculosis which is emerging as one of the major killers. The WHO in 1993 has declared tuberculosis as a global emergency [1]. Pulmonary tuberculosis is the commonest form but extra pulmonary tuberculosis can affect any organ system of the body. It is estimated that 10%-15% of tuberculosis is extra pulmonary [1]. During the past decade the clinical pattern and presentation of tuberculosis has changed dramatically, much of the traditional learning about this disease is no longer true and tuberculosis has become a new entity [2]. We at the National Hospital of Sri Lanka came across many tuberculosis patients with involvement of atypical sites and unusual presentations. It has been reported in several studies that tuberculosis has involved unusual sites such as tongue [3], iliac bone presenting as buttock abscess [1], oesophagus [4], thyroid [5] and stomach

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[6]. There is a study from India analyzing the tuberculosis in the head and neck [7] and another one assessing the clinical patterns of cervical tuberculous lymphadenopathy [2]. However not many recent studies have been documented on the overall clinical pattern of the disease in the literature. Studies correlating lab parameters with cyto histology have given variable results [8,9,10,11,12, 13,14,15,16].

Atypical presentations render diagnosis challenging, resulting in delay in diagnosis, increased complications, morbidity and mortality. In addition, clinically and radiologically some atypical presentations may mimic malignancy, thus adding to the confusion. However the excellent response to antituberculous therapy warrants that these patients are not misdiagnosed and mismanaged. Diagnosis at an early stage is by far the most important aspect in the management of tuberculosis. This unusual presentation makes the diagnosis difficult at the initial stage. So awareness of the atypical presentations helps to diagnose early, avoid unnecessary invasive investigations and complication.

Aim of the study is to describe the clinical patterns of tuberculosis in the recent past in a tertiary center and to study the clinico pathological parameters in relation to cyto histological features. This descriptive, retrospective study was designed to analyse clinical patterns of tuberculosis in a cohort of patients presented to National Hospital of Sri Lanka within a period of one year from 1st January 2006 to 31st December 2006 and a prospective part was designed to correlate the clinico pathological parameters (clinical pattern, ESR, mantoux and acid fast bacilli positivity) with the morphological features in the biopsy sample and cytology specimens during a period of six months from April to September 2007.

Methods

Study population

All patients who had been diagnosed as tuberculosis by histological or cytological means were selected. During the specified time period there were 260 cases which full filled the eligibility criteria. For the prospective part all patients clinically suspected of having tuberculosis were selected. There were 91 cases that full filled the eligibility criteria during the specified time period.

Materials

The records at the Department of histopathology NHSL were searched and data were collected in to a data extraction form. All the histology/cytology slides of the corresponding cases were reviewed. Material for prospective study was obtained from three sources: Fine needle aspirations performed in all patients who were referred to our department with the clinical suspicion of tuberculosis and had accessible lesions, samples received from guided aspirations and histological sections and biopsy samples from suspected cases. Smears prepared from aspiration samples and histology sections were first examined by the candidate and later discussed with the supervisor. Cases having diagnostic features of tuberculosis were selected and Ziehl Neelsen stain was performed. These slides were also examined by the candidate for the presence or absence of acid fast bacilli and later discussed with the supervisor. Clinical details and investigations were collected from bed head tickets and the records in the haematology laboratory at NHSL. Patients who did not have investigations were referred to chest clinic/MRI for a Mantoux test and ESR was done at the haematology department/NHSL.

Ethical clearance

Ethical clearance was obtained from the ethical committee of the National Hospital of Sri Lanka.

Results

Clinical patterns

A total of 260 cases were analysed in this study. Tuberculous lymphadenitis accounted for 53.07 %(138 cases) while 18.07% (47 cases) had pleural effusion. 5.38% (14cases) had spinal tuberculosis, 3.84% (10 cases) had TB involving the central nervous system and 2.69% (7cases) had joint tuberculosis.The distribution of these patterns is shown in figure 1.

The commonest presentation tuberculous lymphadenitis was further analysed in a view to find out the relationship with specific lymphnodes. (Figure 2). Among 138 patients with tuberculous lymphadenitis 86.23 % (119 cases) had involvement of the cervical group of the lymphnodes. Of these 72.2% (86cases) presented with deep cervical lymphadenopathy (the lymphnodes extending along the jugular vein from the base of the skull to root of the neck), 15.9% (19cases) had supraclavicular lymphadenitis. Posterior cervical lymphnode enlargement was observed in 5.8 % (7cases), 4.2% (5cases) had submandibular lymphnode enlargement. Parotid lymphnode and submental lymphnode enlargement were found in one case in each presentation (0.8%). (Figure 3).

On further analysis of the joint tuberculosis (7cases), involvement of all the large joints of the body was identified namely, hip joint (one case, 14.28%), knee (one case), shoulder (one case), elbow (one case), wrist (2 cases, 28.57%) and ankle joint (one case). This pattern highlights involvement of large joints of the body.

Correlation of cytohistology with clinicopathological parameters

Correlation of clinical pattern and other investigations (ESR, Mantoux and AFB positivity) with morphological features was done as a part of this study. 91 cases which had cyto histological features of tuberculosis were enrolled for this study. Among this 70.32% (64cases) of the cases revealed caseation, multinucleated giant cells were identified in 27.47% (25 cases) of cases and 12.08% of cases (11cases) had only epithelioid histiocytes.

Clinical presentation

Out of 91 cases majority were tuberculous lymphadenitis (63.73%, 58 cases). Among this 89.65% (52cases) were cervical lymphadenopathy with the commonest nodal group being the deep cervical lymph node (71.11%, 37cases), followed by supra clavicular (19.23%, 10 cases) and submandibular nodes (3.84%, 2cases). Axillary lymph node enlargement was the second frequent finding among the TB lymphadenopathy (6.89%, 4cases). Second common presentation observed was pleural involvement commonly as pleural effusion (14.28%, 13cases). Other presentations were shown in Table 1:

ESR

Out of 91 cases 21.97 % (20 cases) showed ESR >100/1st hour and 43.95% (40 cases) showed ESR >70/1st hour. In cases with high ESR (>70/1st hour), 67.5 % showed caseation, 40% had multinucleated giant cells and 20% had only epithelioid histiocytes. ESR was high in cases which has caseation; however this was not statistically significant (p = 0.281).

Mantoux test

Out of 91 cases, 73.62% (67cases) were mantoux positive. Caseation was identified in 71.64% of these cases, 37.31% of the cases showed multinucleated giant cells and 11.94% had only epithelioid histiocytes. Mantoux positivity was high in cases which has caseation; however this was not statistically significant (p=0.1251).

AFB positivity

Out of 91 cases 51.64% (47cases) were AFB positive. Among this 80.85% showed caseation. 19.14% of the cases showed multinucleated giant cells and 10.63% revealed only epithelioid histiocytes. It was found that 81% of AFB positive cases revealed caseation and 59% of caseation positive cases were AFB positive. The percentages showed a significant difference (x = 5.1567 with 1 degree of freedom; P=0.016 with confidence intervals 3-40%).These AFB positive cases were further analysed in relation to the type of specimens. Among the AFB positive cases 85.10% (40 cases) were cytology specimens. 14.89% (7cases) were histology specimens. Out of 09 fluid samples included in this study (pleural aspirates, peritoneal fluid and all guided aspirations where large amount of fluid was obtained) 08 were AFB positive. All findings are summarized in Table 2 and 3.

Figure 1. Clinical presentation of tuberculosis

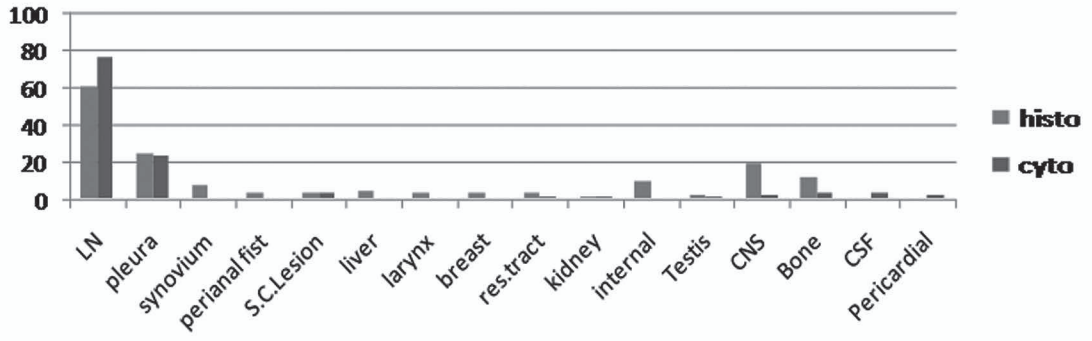

Figure 2 : Lymph node involved in TB.

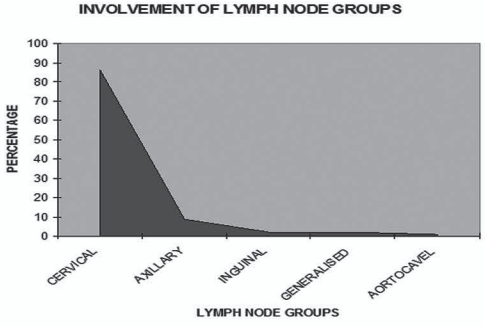

Figure 3: Cervical lymph nodes involved in TB.

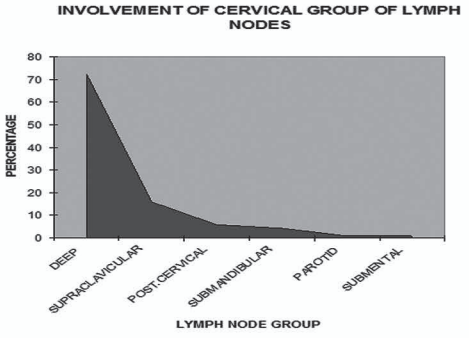

Table 1: Distribution of Tuberculosis.

Site	Number of cases
Spinal TB	3
Peritoneal TB	3
Gastrointestinal tract TB	3
CNS TB	2
Chest wall lump	2
Breast lump	1
TB middle ear/Mastoid antrum	1
Tarso metatarsal joint – big toe	1
Pulmonary TB	1
TB pericardium	1
Bladder	1
Psoas abscess	1

Table 2: Morphological features in the two common clinical presentations

Morphological features	Lymphadenitis(% of cases)n=58	Pleural tuberculosis (% of cases)n = 13
Caseation	78.12%	4.68%
Multinucleated giant cells	32%	32%
Only epithelioidhistiocytes	18.18%	54.54%

Table 3:Comparison of morphological features with pathological parameters

Morphological features	High ESR>70mm/1st hour (% of cases) n = 91	Mantoux positive cases (% of cases) n = 91	AFB positive cases (% of cases) n = 91
Caseation	67.5	71.64	80.85
Multinucleated giant cells	40	37.31	19.14
Epithelioidhistiocytes only	20	11.94	10.63

Discussion

Tuberculosis is one of the biggest health challenges the world is facing [2]. Even with improvement in economic and social conditions and the use of effective anti-tuberculous therapy it is still seen that extra pulmonary presentations form a major proportion of new cases, especially in third world countries [7]. This study looked at various patterns of clinical presentations with special consideration of the association of cytohistological features to other clinico pathological parameters.

Clinical patterns of tuberculosis

The most common clinical presentation identified in this study was tuberculous lymphadenitis (53.07%).This pattern was observed in both retrospective and prospective parts of the study. A similar study done among HIV infected children in West Indies has revealed lymphadenopathy as the commonest clinical presentation in 58% of the study population [17]. Prasad KC and his co workers in India have found 73.3% isolated tuberculous lymphadenitis [7] which is considerably higher than our findings. This study has analysed only the cases with head and neck tuberculosis. This could be the reason for their higher result. In addition to the various other common clinical presentations, unusual presentations such as breast lump, scalp lytic lump, swelling in the thyroid region, shoulder joint tuberculosis, subcutaneous tuberculosis in the form of cheek lump, fore arm lump, thigh lump, and chest wall lump were identified in this study. The prospective study has showed tuberculosis of the tarso meta tarsal joint and

middle ear. The literature survey has revealed several studies in relation to this topic and some of our findings are in keeping with the documented evidence in the literature. Tuberculosis of the stomach [6], oesophagus [4], primary tuberculosis of the tongue presenting as a nodular swelling [3], TB pancreas [8], tubercular mastitis in men [18], unusual presentation of the lupus vulgaris over the face [19], primary tubercular pyomyositis, bursitis, tenosynovitis [20], shoulder joint tuberculosis [21], thyroid tuberculosis [5] and tuberculosis involving the sternal notch [22] are some of the reported atypical presentations. Tenosynovitis of the tendon of the ankle and foot has also been seldom reported in the literature [20, 23]. Tuberculosis of the thyroid region of our study was diagnosed by fine needle aspiration cytology. Thyroid cells or colloid was not recognized in this aspirate. However, this could be thyroid tuberculosis or TB involving the subcutaneous tissue of the thyroid/ sternal notch region or TB of the pretracheal lymphnode. A similar case in E.Khalil et al's study was found to be pretracheal tubercular lymphadenitis. [22] Tubercular mastitis apart from an unusual presentation, is a difficult diagnosis as many breast lesions elicit a granulomatous reaction. Therefore high index of suspicion and awareness of this clinical presentation are necessary to prevent delay in treatment and unnecessary surgery.

Tuberculous lymphadenitis group

Among the tuberculous lymphadenitis, the cervical lymph nodes are the most commonly affected group of lymph nodes. This is in keeping with the findings observed in literature [9]. This predilection for the cervical lymph node is due to the main portal of entry of the bacilli through tonsils, adenoids and other members of Waldeyer's ring and occasionally through carious teeth. Presence of a very rich lymphatic bed in cervical region and repeated attacks of inflammation from childhood render the cervical nodes more susceptible to tuberculosis [24].Among the cervical lymph node groups the deep cervical lymphnodes were the most commonly affected lymph nodes. B.C.Jha and co workers in India have obtained similar findings [2]. However a study done by Maharjan.M et al in Nepal has revealed the posterior cervical lymph node being the commonest cervical lymph node affected [9]. It has been documented that there is a direct lymphatic connection between the adenoids and the nodes of the posterior triangle [24]. Common portal of entry of the bacilli through adenoids in this region or population could be the reason for this finding.

Correlation of cytohistological features with clinico pathological parameters

The type of inflammatory reaction leading to the caseating granuloma with or without Langhan type giant cells is characteristic of mycobacterial infection. This is a lengthy, multistep process. E. M. Medlar in his study of the process of caseation and giant cells in tuberculosis has found that the initial cellular reaction in 15 to 20 days of infection consists almost entirely of epithelioid histiocytes. Beginning at 20 day and continuing in the 30-35day, when there is damage to the histiocytes, polymorpho nuclear leucocytes are attracted which later initiate the process of caseation. In lesions of 6, 7and 8 weeks duration the picture of caseation is present in many of the larger lesions. At this stage of reaction, as a reparative process giant cell formation begins to take place [25]. In our study caseation was identified in 70.32% of the study population indicating that majority of the cases have been detected at the later stage of the illness. This is higher than the finding of Tarun Dua and co worker's study of cytology in tuberculous lymphadenitis [10]. Only 12% of cases have been identified at the initial stage of granulomatous reaction. However detection of caseous material in cytology specimens could vary among pathologists. Also caseous material may be absent due to sampling error (not hitting the exact site of lymph node by FNAC needle) or if the caseation is minimal in the affected region it could be absent in the smears. This applies to multinucleated giant cells too.

Clinical presentation compared to cyto histology

Caseous necrosis was commonly found in tubercular lymphadenitis (78.12%) in this study. Again this implies that these cases have been detected fairly late in the course of the disease as most lymphadenopathies do not cause significant symptoms. Whereas pure histiocytic collection has been identified in majority of the pleural tuberculosis (54.54%), as pleural effusion in these cases makes them present early.

ESR compared to cyto histology

Only 43.95% of the study population showed high ESR. Several related studies have revealed various proportion of high ESR ranging from 23.07% (9) to 79% [9]. A study carried out by J.G Saluja et al has showed high ESR in 90% in children with tuberculosis (all of them had anaemia) and 23.07% in adults with tuberculosis (57.67% had anaemia) (18). However another study from Qatar has found that one third of children with TB had a normal ESR at the time of diagnosis. [16].Thus ESR is a variable parameter and depends on age, status of haemoglobin and other concurrent infections. Also in our study ESR > 70mm/1st hour was taken as significant. In the above study >40-50mm/1st hour had been considered as significant. This could also be a reason for the different observations obtained in various studies.Abnormal ESR value alone is not diagnostic of any disease condition, but with other evidences, it helps in diagnosis. ESR also has a more prognostic significance in assessing the course taken by a disease in response to treatment. It is

apparent that large numbers of ESR positive cases are at the late stages of the disease with formation of caseation (67%) and multinucleated giant cells (40%). Only 20% of cases have shown high ESR at the initial stage of the disease with only histiocytic granuloma.

Mantoux compared to cyto histology

Out of 91 cases, 73.62% were mantoux positive. The reported reactivity of tuberculin test in the literature ranged from none to very strong [12]. In one of these studies [12] high percentage of tuberculin negative reaction had been observed in patients who had small lymph nodes (<1cm). High tuberculin positivity has been observed in children compared to adults in studies done by Deepjyoti V.Gadre *et al* [20] and J.C.Saluja and co worker [11]. This age factor and size of the lesion may also have influenced the mantoux reactivity in our study. Delayed hypersensitivity is a complex procedure and takes about six weeks for tuberculin test to be positive. Our study results are in keeping with this as most mantoux positive cases are at the late stage of the disease with caseation and giant cells rather than with pure histiocytes. (72%, 37% and 12% respectively).

AFB compared to cyto histology

51.64 % over all acid fast bacilli positivity is in keeping with the finding of a study carried out by Metre [14]. However several other studies have obtained lower values [14,15,9,10]. This could probably be due the fact that some of these studies have been done in children in whom open tuberculosis, AFB positivity, and necrotic lesions are far less common. Also treatment with antituberculous drugs and, presence of very few bacilli in the lesion could attribute to a low yield of AFB. It is known that for acid fast bacilli to be demonstrated microscopically, their number should be 10 000 to 100 000/ml of material [14]. A marked difference was observed when the cytohistological was compared for AFB positivity. A lower rate of positivity was observed with presence of only granulomatous features. Caseation or necrosis was associated with high AFB positivity. This was found to be statistically significant. This observation is in close agreement with several studies [10, 14] probably due to the fact that the central necrotic portion of the tubercle contains numerous bacilli [10]. In our study 86.95% of the AFB positive cases were cytology specimens. Chances of identifying acid fast bacilli in histopathology sections are much lower. The effect of formalin and xylene on the stain ability of mycobacteria by Ziehl Neelsen method results in extreme low sensitivity of detection [15].

Conclusions

Tubercolous lymphadenitis was the major clinical presentation identified in this study with the cervical nodes being the commonly affected lymphnode group. Amongst this the deep cervical lymphnode was found to be most frequently involved by the tuberculosis. Isolated breast lump, scalp lytic lump, swelling in the thyroid region, subcutaneous lumps, TB of the shoulder joint, swelling of the tarso meta tarsal joint of the great toe and middle ear tuberculosis were the atypical presentations identified in this study. Majority of the cases especially the tuberculous lymphadenitis have been diagnosed at 6 -8weeks of the infection with formation of caseation and multinuclear giant cells. Whereas pleural tuberculosis has been detected at the early, at only granulomatous stage (This presumptive conclusion was made in relation to the study by E M Medlar [25].Statistically significant correlation was found between caseation and AFB positivity.High proportion of mantoux positivity, high ESR and AFB positivity are seen at the late stage of the disease (6-8weeks). Therefore the only means of diagnosis at an early stage of infection is cyto histological assessment of the appropriate specimen.

Limitations

The material in this study was obtained from a setting of a tertiary care hospital with specialized units. So the results obtained may be valid for the relevant population.Limited volume of material that can be aspirated during the fine needle aspiration cytology procedure is also a limiting factor. This can limit the sensitivity of detection of caseation, multinucleated giant cells and acid fast bacilli.

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Thosai mixed with side dishes altered the Glycaemic Index

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(Keywords: Glycaemic index, glycaemic response, Thosai, fruits)

Abstract

Objective To determine the GI values of 'Thosai' mixed with different side dishes

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Methods Healthy volunteers (20) with mean age, weight, and height and body mass index of the 20.05 (±0.92) years, 54.70 (±5.74) kg, 1.63 (±0.08) m and 20.73 (±2.63) kgm^{-2} respectively were selected with their informed written consent. After overnight fasting 75g glucose and each test food containing 75g digestible carbohydrate were administered at different instances and blood glucose levels were measured half hourly for two hours. The GI values were calculated and analyzed by Randomized Complete Block Design using SAS analytical package.

Results The mean GI values of 'Thosai' either with 'sambol' or 'sambol' & plantain ('Itharai' variety) or 'sampar' or 'sampar' & plantain or 'sambol' & 'sampar' or 'sambol', 'sampar' & plantain were 63.93 (±7.62), 60.17 (±3.58), 71.90 (±4.73), 68.57 (±4.18), 65.63 (±3.46)and63.04 (±5.05) % respectively.

Conclusions Thus, when consuming the basic foods with different side dishes, the GI values would be altered. Therefore, when dietary advices are given to diabetic and coronary heart disease patients, not only the basic foods, but also the side dishes have to be considered.

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Introduction

The glycaemic index (GI) is an important parameter which compares the hyperglycaemic effect of a tested meal with pure glucose (1). The blood glucose response to a food is reflected by its glycaemic index of a particular food. Glycaemic index is defined as the incremental area under the blood glucose response curve elicited over a two-hour period by a 75g carbohydrate portion of a food, expressed as a percentage of the response to the same amount of carbohydrate from a standard food taken by the same subject (2). Foods with GI values of 70 or more are considered to be high GI diet, with an index value between 55 to 69 as medium GI diet and less than 55 as low GI diets (3).

The aim of the study was to determine the GI values of commonly consumed thosai mixed with meals to recommend to the diabetic, obese and coronary vascular disease patients. The evaluation of GI will help the local public to decide on the foods which have to be consumed.

Hence, in this study the GI values of 'Thosai' either with 'sambol' or 'sambol' & plantain ('itharai') or 'sampar' or 'sampar' & plantain or 'sambol' & 'sampar' or 'sambol', 'sampar' & plantain were determined.

Methods

Materials

The pure glucose (Royal Pure Glucose, Smithkline Beecham Pvt Ltd, Moratuwa), 'Thosai','sambol', sambar and plantain ('itharai') were used for this study.

Preparations of foods

The black gram was soaked into water for 8 hrs and was grand in a domestic grinder. It was mixed with wheat flour and rice flour (1:1:1 ratio) and was fermented overnight. 'Thosai' was prepared from the mix by roasting in the pan for 5 min.

The 'sampar' was prepared by taking following ingridients.Pumpkin (dubai), yellow dhal, carrot ,brinjol and tomatoes were washed well in water and were cooked in water with onions and chilly for 20min.Then coconut milk powder and chili powder were added and cooked well.

The sampol was prepared as follows;The onions, Chilly, salt were added and ground in a domestic grinder. Then scraped coconut was added and grand for 10min. The ripped ''itharai'' variety of plantain was purchased in local market.

Analysis of foods

All foods were analyzed for their total sugar (4), total protein (Pearson,14976), moisture (4), and soluble

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dietary fiber (5), insoluble dietary fiber (5), & total dietary fiber (5) contents .

Selection of subjects

A group of 20 healthy volunteers between 20 to 22 years old was selected and the weight & height were determined and body mass index were calculated. The volunteers who had abnormal glucose tolerance, underweight or overweight, dieting or restricting their carbohydrate intake, suffering from any illness or food allergy were excluded from the study.

Ethical clearance

The ethical clearance for this study was obtained from the 'Ethical Review Committee', Faculty of Medicine, University of Jaffna.

Estimation of blood glucose level of volunteers

The blood samples were collected and measured using semiautomated biochemical analyzer (TC 3300).

Calculation of glycaemic response and glycaemic index values

Glycaemic index and glycaemic response were calculated (6).

Statistical analysis

Glycaemic response and glycaemic index values of different types of bakery products were analyzed by Randomized Complete Block Design (RCBD) using SAS analytical package.

Results

Mean age, weight, and height and body mass index of the group I volunteers were 20.05 (±0.92) years, 54.70 (±5.74) kg, 1.63 (±0.08) m and 20.73 (±2.63) kgm^{-2} respectively.When 75g of glucose was orally administered to the volunteers, blood glucose level reached the peak value at 30min. The mean glycaemic response to the reference food (glucose) at 30, 60, 90 and 120 min were 56.70 (±7.51), 35.30 (±7.02), 19.60 (±10.54) and 0.90 (±2.77) $mgdL^{-1}$ respectively. The proximate compositions of different foods are given in Table 1. After overnight fasting (12 h), 75g digestible carbohydrate containing different combinations of selected black gram based combined food items were administered to the volunteers on separate days. Peak glycaemic response to all the foods was obtained at 30min.

When 75.0g digestible carbohydrate containing 'Thosai' with 'sambol' was administered to the ten volunteers, the mean fasting blood glucose level was 91.70 (±4.37) $mgdL^{-1}$ and the mean blood glucose levels at 30, 60, 90 and 120 min were 127.0 (±5.72), 115.10 (±11.77), 106.30 (±12.07) and 94.00 (±4.40) $mgdL^{-1}$ respectively (Table 2). The mean change in glycaemic response at 30, 60, 90 and 120 min were 36.20 (±6.16), 23.40 (±10.41), 14.60 (±12.11), 2.30 (±7.36) $mgdL^{-1}$ respectively.

When 75.0g digestible carbohydrate containing 'Thosai' with 'sambol' and 'itharai' plantain was administered to the ten volunteers, the mean fasting blood glucose level was 94.20 (±3.61) $mgdL^{-1}$ and the mean blood glucose levels at 30, 60, 90 and 120 min were 128.40 (±5.19), 115.80 (±4.76), 106.80 (±6.80) and 94.80 (±3.65) $mgdL^{-1}$ respectively (Table 2). The mean change in glycaemic response at 30, 60, 90 and 120 min were 34.20 (±5.49), 21.60 (±4.90), 12.60 (±6.79) and 0.60 (±3.78) $mgdL^{-1}$ respectively (Table 3).

When 75.0g digestible carbohydrate containing 'Thosai' with 'sampar' was administered to the ten volunteers, the mean fasting blood glucose level was 87.40 (±6.00) $mgdL^{-1}$ and the mean blood glucose levels at 30, 60, 90 and 120 min were 128.00 (±8.33), 117.00 (±12.83), 103.60 (±12.28) and 92.50 (±5.38) $mgdL^{-1}$ respectively (Table 2). The mean change in glycaemic response at 30, 60, 90 and 120 min were 40.60 (±4.72), 29.60 (±11.56), 16.20 (±13.16) and 5.10 (±7.67) $mgdL^{-1}$ respectively (Table 3).

When 75.0g digestible carbohydrate containing 'Thosai' with 'sampar' and 'itharai' plantain was administered to the ten volunteers, the mean fasting blood glucose level was 93.30 (±3.95) $mgdL^{-1}$ and the mean blood glucose levels at 30, 60, 90 and 120 min were 132.30 (±7.50), 120.40 (±6.67), 109.00 (±5.01) and 94.50 (±4.55) $mgdL^{-1}$ respectively (Table 2). The mean change in glycaemic response at 30, 60, 90 and 120 min were 39.00 (±6.24), 27.10 (±6.61), 15.70 (±6.80) and 1.20 (±3.74) $mgdL^{-1}$ respectively (Table 3).

When 75.0g digestible carbohydrate containing 'Thosai' with 'sambol' and 'sampar' was administered to the ten volunteers, the mean fasting blood glucose level was 92.90 (±2.51) $mgdL^{-1}$ and the mean blood glucose levels at 30, 60, 90 and 120 min were 130.10 (±7.16), 110.00 (±6.41), 103.10 (±7.36) and 97.40 (±2.84) $mgdL^{-1}$ respectively (Table 2). The mean change in glycaemic response at 30, 60, 90 and 120 min were 37.20 (±5.33), 17.10 (±6.40), 10.20 (±7.60) and 4.50 (±3.69) $mgdL^{-1}$ respectively (Table 3).

When 75.0g digestible carbohydrate containing 'Thosai' with 'sambol', 'sampar' and 'itharai' plantain was administered to the ten volunteers, the mean fasting blood glucose level was 92.70 (±2.71) $mgdL^{-1}$ and the mean blood glucose levels at 30, 60, 90 and 120 min were 128.30 (±4.42), 120.30 (±4.55), 104.10 (±8.29) and 95.50 (±4.77) $mgdL^{-1}$ respectively (Table 2). The mean change

in glycaemic response at 30, 60, 90 and 120 min were 35.60 (±4.67), 27.60 (±3.96), 11.40 (±8.10) and 2.80 (±4.21) $mgdL^{-1}$ respectively (Table 3).

The mean GI values of 'Thosai' either with 'sambol' or 'sambol' & plantain ('itharai') or 'sampar' or 'sampar' & plantain ('itharai') or 'sambol' & 'sampar' or 'sambol', 'sampar' & plantain ('itharai') were 63.93 (±7.62), 60.17 (±3.58), 71.90 (±4.73), 68.57 (±4.18), 65.63 (±3.46) and 63.04 (±5.05) % respectively. (Table 4).

The glycaemic response of glucose differed significantly ($p<0.05$) from 'Thosai' with 'sambol' or 'sambol' & 'itharai' plantain or 'sampar' & 'itharai' plantain or 'sambol' & 'sampar' or 'sambol', 'sampar' & 'itharai' plantain . The glycaemic response and glycaemic index values of 'Thosai' with 'sambol' differed significantly ($p<0.05$) from that of 'Thosai' with 'sambol' and 'itharai' plantain. The glycaemic response of 'Thosai' with 'sampar' did not differ significantly ($p>0.05$) from that of 'Thosai' with 'sampar' and 'itharai' plantain, while the glycaemic index value of 'Thosai' with 'sampar' differed significantly ($p<0.05$) from 'Thosai' with 'sampar' and 'itharai' plantain. The glycaemic response and glycaemic index values of 'Thosai' with 'sambol' and 'sampar' did not differ significantly ($p>0.05$) from 'Thosai' with 'sambol', 'sampar' and 'itharai' plantain.

Discussion

The GI of same amount of digestible carbohydrate containing cooked 'Thosai' either with 'sambol' or 'sambol' & plantain ('itharai') or 'sampar' or 'sampar' & plantain or 'sambol' & 'sampar' or 'sambol', 'sampar' & plantain were 63.93 (±7.62), 60.17 (±3.58), 71.90 (±4.73), 68.57 (±4.18), 65.63 (±3.46) and 63.04 (±5.05) % respectively. Based on these GI values, it can be suggested that 'Thosai' either with 'sambol' or 'sambol' & plantain or 'sampar' & plantain or 'sambol' & 'sampar' or 'sambol', 'sampar' & plantain are medium GI foods. The 'Thosai' either with 'sampar' is high GI food.

According to previous studies, the mean glycaemic index value of 'Thosai' with 'sambol' [63.93 (±7.62) %] was higher than that of "Thosai" [55.0 (±2.0) %] (Parboiled and raw rice, soaked, ground, fermented and toasted) with 'chutney' from a study in India (7, 8). The mean glycaemic index value of 'Thosai' with 'sambol' [63.93 (±7.62) %] was lower than that of "Thosai" [73.0 (±3.0) %] (Parboiled and raw rice, soaked, ground, fermented and toasted) with 'chutney' from another study in India (8). The mean glycaemic index value of 'Thosai' with 'sampar' and 'sampar' & 'itharai' plantain [71.90 (±4.73) and 68.59 (±4.18) % respectively] was closer to that of 'Thosai' [73.0 (±3.0) %] (Parboiled and raw rice, soaked, ground, fermented and toasted) with 'chutney' from India (8).

Among the different combinations of 'Thosai' studied with six different side dishes, 'Thosai' with 'sambol' & plantain is the best choice. Consumption of 'Thosai' either with 'sambol' or 'sambol' and plantain for those who need a low GI diet is advisable. Even though the above diets are selected for the diabetic and coronary heart disease patients, recommendation of the diets should be made the after analyzing their GI, glycaemic load and energy contents.

Table 1: Proximate compositions (%) of 'Thosai','sambol', 'sampar' and 'itharai' plantain

Food items	'Thosai'	'Sambol'	'Sampar'	'Itharai' variety of plantain
Total CHO	39.2 (±0.17)	3.5 (±0.05)	4.5 (±0.08)	30.7 (±1.42)
Total Protein	8.2 (±0.18)	2.6 (±0.25)	2.7 (±0.12)	1.0 (±0.02)
Total Digestible CHO	38.1 (±0.18)	2.2 (±0.25)	3.8 (±0.12)	27.7 (±1.42)
Total fiber	1.1 (±0.0)	1.2 (±0.01)	0.7 (±0.0)	3.7 (±0.05)
Soluble fiber	0.7 (±0.0)	0.8 (±0.0)	0.4 (±0.0)	0.7 (±0.04)
Insoluble fiber	0.4 (±0.0)	0.4 (±0.0)	0.3 (±0.0)	2.9 (±0.03)
Moisture	50.5 (±0.14)	66.1 (±0.61)	85.6 (±0.20)	63.7 (±1.41)

Table 2: The changes in blood glucose (mg/dL) values of 'Thosai' with different side dishes

	Blood glucose level (mg/dL)			
'Thosai' with	30 min	60 min	90 min	120 min
'Sambol'	127.0 (±5.72)	115.1 (±11.77)	106.3 (±12.07)	94.0 (±4.40)
'Sambol' & Plantain	128.4 (±5.19)	115.8 (±4.76)	106.8 (±6.80)	94.8 (±3.65)
'Sampar'	128.0 (±8.33)	117.0 (±12.83)	103.6 (±12.28)	92.5 (±5.38)
' Sampar' & Plantain	132.3 (±7.50)	120.4 (±6.67)	109.0 (±5.01)	94.5 (±4.55)
'Sambol' & 'Sampar'	130.1 (±7.16)	110.0 (±6.41)	103.1 (±7.36)	97.4 (±2.84)
'Sambol','Sampar'& Plantain	128.3 (±4.42)	120.3 (±4.55)	104.1 (±8.29)	95.5 (±4.77)

Table 3: The glycaemic responses (mg/dl) values of 'Thosai' with different side dishes

'Thosai' with	Glycaemic Response (mg/dL) 30 min	60 min	90 min	120 min
'Sambol'	36.2 (±6.16)	23.4 (±10.41)	14.6 (±12.11)	2.3 (±7.36)
'Sambol' & Plantain	34.2 (±5.49)	21.6 (±4.90)	12.6 (±6.79)	0.6 (±3.78)
'Sampar'	40.6 (±4.72)	29.6 (±11.56)	16.2 (±13.16)	5.1 (±7.67)
'Sampar' & Plantain	39.0 (±6.24)	27.1 (±6.61)	15.7 (±6.80)	1.2 (±3.74)
'Sambol' & 'Sampar'	37.2 (±5.33)	17.1 (±6.40)	10.2 (±7.60)	4.5 (±3.69)
'Sambol','Sampar' & Plantain	35.6 (±4.67)	27.6 (±3.96)	11.4 (±8.10)	2.8 (±4.21)

Table 4: Glycaemic Index (%) of 'Thosai' with different side dishes

Different combinations of side dishes with 'Thosai'	Glycaemic Index (%)
'Sambol'	63.93 (±7.62)
'Sambol' & 'Plantain'	60.17 (±3.58)
'Sampar'	71.90 (±4.73)
'Sampar' & Plantain'	68.59 (±4.18)
'Sambol' & 'Sampar'	65.63 (±3.46)
'Sambol','Sampar' & Plantain'	63.04 (±5.05)

The composition of the food or meal will influence the blood glucose response. Further foods within the same classification can have different glycaemic indices. For example, the different varieties of potatoes, cereals showed variations in glycaemic indices (9,10). Furthermore processing of the food influences the GI. During cooking gelatinization of starch takes place, the cell walls are ruptured and the starch molecules are released (11) . Therefore structural integrity of cell wall and starch granules also determine the glycaemic index. However, the methods of preparations of 'sambol' & 'sampar' were different. The moisture contents of the both preparations varied significantly. Thus the GI of 'Thosai' with sampar was higher than that of 'sambol'. When the moisture content of the food is high the digestion of the food will be easier and hence the glucose release into the blood will be quicker (9) .

When the total dietary fibre, soluble dietary fibre and insoluble dietary fibre contents are considered in the different basic diet in combination with different side dishes, no direct correlations with the changes in the GI were observed (Tables 2 and 3). An increase in the total fibre content of food can delay the glycaemic response (12). Fibre delays the digestion of starch in the stomach, transition time of the stomach contents to the duodenum, delay the diffusion of different saccharides in the duodenum, delay the hydrolysis of polysaccharides in the duodenum and delay the absorption of monosaccharides through the microvillai of the epithelial cells of the jejunum and the upper part of the ileum (13). Total dietary fibre content has a significant negative correlation with GI (14). Based on the results, the 'Thosai' with 'itharai plantain' was the best basic food having lowest GI with all different combinations of side dishes. With 'itharai plantain', the low GI was obtained with all different combinations of side dishes .When consumed without 'itharai plantain', the GI of all different combinations of side dishes increased (Tables 3). The results from this study indicated that the GI of the diet does not depend only on the type of the basic food but also on the side dishes consumed. From the results it can be concluded that glycaemic index of a mixed diet is influenced by the ingredients included in the curries. Digestibility of sorgum, winged bean and horse gram was not influenced when it was supplemented with the red chilli, cumin, black pepper, coriander, garlic, asafoetide, dry ginger and ajowan (15). The digestibility of proteins of different legumes was decreased by chili and coriander (16). Therefore it is not possible to support the increase in glycaemic index of the food combinations with gravy, due to added spices. Inclusion of gravy to the different basic foods increased the GI. This may be due to the increased digestibility with high moisture content of the foods. However, further research on this observation is necessary.

Conclusions

Based on these GI values, it can be suggested that 'Thosai' either with 'sambol' or 'sambol' & plantain or 'sampar' & plantain or 'sambol' & 'sampar' or 'sambol', 'sampar' & plantain are medium GI foods (the GI values between 55 to 70%). The 'Thosai' either with 'sampar' is high GI food (the GI values are more than 70 %). When plantain ('itharai') was given with 'Thosai', the GI values were decreased. When these foods were eaten with 'sampar', the GI values were increased. The GI values were increased when the foods were consumed with 'sampar' alone or 'sampar' and 'sambol'. Thus, when consuming the basic foods with different side dishes, the GI values would be altered. Therefore, when dietary advices are given to diabetic and coronary heart disease patients, not only the basic foods have to be considered

but also the side dishes to be consumed. Consumption of food containing fiber diet will significantly reduce the rise in blood sugar level. However recommendation of the foods should be made after analyzing the glycaemic index, glycemic load and energy contents of the foods.

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Influence of maternal and fetal factors on low birth weight at Teaching Hospital, Batticaloa

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(Key Words: maternal factors, fetal factors, low birth weight)

Abstract

Objective To determine the mean birth weight and prevalence of low birth weight and to assess the influence of maternal (ethnicity, age and parity) and fetal factors (gender and singleton or multiple) on LBW.

Methods A hospital based descriptive cross sectional study was conducted among all live births during June to August 2010 at Teaching Hospital Batticaloa. Data was obtained from birth registry in the Labour Ward.

*Results*1715 babies were born during the study period. The mean birth weight of all newborn was 2917.43g and the prevalence of LBW was 15.41%.The prevalence of LBW was higher among Tamils than Muslims. Higher prevalence rate of LBW were below 25years and above 36years age group . Prevalence of LBW was significantly high in first & second parity and over 6thparity. Female babies had higher prevalence rate for LBW than male babies. Twin babies were more vulnerable to be born as LBW than Single birth.

Conclusions Both maternal and fetal factor considered for LBW in this study were found to be significantly associated with LBW. Reductions in teenage, elderly pregnancy and above 6th parity are essential for reducing LBW.

Batticaloa Medical Journal 2014; **6**: 29-31

Introduction

Low birth weight (LBW) has been defined by the WHO as weight at birth of less than 2,500 grams. A baby's low weight at birth is either the result of preterm birth or of restricted fetal growth. Low birth weight is closely associated with neonatal mortality and morbidity, inhibited growth and cognitive development, and chronic diseases later in life [1]. LBW infants have 40-fold greater risk of dying in the neonatal period [2].LBW still remains a major public health problem. Globally, more than 20 million infants are born with low birth weight and level of low birth weight in developing countries (16.5 per cent) is more than double the level in developed regions (7 per cent) [1].

Even though several risk factors have been identified, they operate to different extent in different culture and environment. As far as we are aware, research on low birth weight and its association with risk factors has not yet done in eastern Sri Lanka.

Objective of this study is to determine mean birth weight and the prevalence of low birth weight; to assess the influence of maternal factors (ethnicity, age and parity) and fetal factors (gender and singleton or multiple) on LBW at Batticaloa Teaching Hospital.

Methods

A hospital based descriptive cross sectional study was conducted among all live births during June to August 2010 at the Teaching Hospital Batticaloa. Ethical clearance for this study was obtained from Ethical Review Committee, Faculty of Health-Care Sciences, Eastern University, Sri Lanka.

Data regarding age, parity and ethnicity of mother, gender of newborn, birth weight and outcome of pregnancy (singleton or multiple) were obtained from birth registry in labor Ward. Data Recording Form was used to collect data. Data were entered into Microsoft Excel worksheet then analyzed with SPSS software (ver.19.0). Birth weight was categorized into LBW (<2500g) and normal weight (e"2500g) groups. Age and parity were also categorized into subgroups. Associations between birth weight and risk factors were assessed with chi-square test, taking a level of significance of $P<0.05$.

Results

1715 babies were born during study period. Birth weights

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of two newborns were not available and hence they were excluded from the study. The mean birth weight was 2917.43g (SD 484.94g).Among 1713babies, 264 babies were of low birth weight so overall prevalence of LBW was 15.41% (264/1713).

Out 1713 babies, 1083 of them were born to Tamil, 628 babies to Muslim and 2 babies to Sinhala mothers. Hence babies were born to Sinhala mothers were excluded for chi-square test when assessing ethnicity and birth weight. Prevalence of LBW was 18.3% in Tamils and 10.5% Muslim community. The association between ethnicity and birth weight was found to be highly significant (X^2=18.41,P<0.001).

Ages of 1683 mothers were available and they were categorized into subgroups. LBW prevalence rates were20%, 17.3%, 13.5%, 13.8%, 16.8% and 50% in below 19years, 19-24yrs, 25-30yrs, 31-36yrs, 37-42yrs and over 42yrs age groups respectively. A statistically significant association between maternal age and weight of baby was found in this study (X^2=11.1; P=0.049).

LBW prevalence rates were 16.2%, 14.2%, 9.7% and 40% in 1st&2nd,3rd&4th,5th&6th and over 6th parityrespectively. The relationship between parity and birth weight was found to be significant (X^2=8.36; P=0.039).

Prevalence of LBW was 17.8% in female and 13.1% in male. The association between gender and birth weight was found to be significant (X^2=7.22; P=0.007). Prevalence of LBW was 63.2% in babies who were born from twin pregnancy and 14.3% among singleton. Highly significant (X^2=97.96; P<0.001) association was found in chi-square test.

Discussion

This study revealed a relatively higher value for mean birth weight when compared to study by Nanayakkara *et al* at Teaching Hospital Kandy (2854g) [3]. The prevalence of LBW in Sri Lanka is 16.6% according to the DHS 2006/ 07 which fluctuated between 16% and 18% over last two decades [4]. However, lower prevalence of LBW was observed in this study (15.41%).

The prevalence of LBW was higher in Tamils (18.3%) than Muslim community (10.5%). Since there is a significant different in LBW between two ethnic groups, study of socio-economic factors should be taken into consideration.

Table 1: Relationship between risk factors and birth weight

Risk factor		Newborns (n)	LBW (n)	(%)	*P* value
Ethnicity	Tamil	1083	198	18.3%	*P*<0.001
	Muslim	628	66	10.5%	
Maternal age (years)	<19	105	21	20.0%	*P*=0.049
	19-24	485	84	17.3%	
	25-30	614	83	13.5%	
	31-36	348	48	13.8%	
	37-42	125	21	16.8%	
	>42	6	3	50.0%	
Parity	1st&2nd	1193	193	16.2%	*P*=0.039
	3rd&4th	393	56	14.2%	
	5th&6th	113	11	9.7%	
	Above 6th	10	4	40%	
Gender	Male	870	114	13.1%	*P*=0.007
	Female	843	150	17.8%	
Outcomeof pregnancy	Singleton	1675	240	14.3%	*P*<0.001
	Twin	38	24	63.2%	

Low prevalence of LBW was found in 25-30years and 31-36years age groups. Under 25years and over 36years age groups were having higher prevalence rates. Even though maternal age under 25 years found to be having more risk of LBW, 35.1% (590/1683) newborns were born to mothers belong to this age groups. Sharma *et al* [5] and Shiva *et al* [6] have reported that babies born to mothers younger than 20 years having more risk.

Prevalence of LBW that was significantly high in first & second parity and over 6th parity when compared to 3rd& 4th and 5th& 6th parities. Study of Malik *et al* revealed that LBW rate in 1st parity mothers was significantly higher than 2nd and 3rdparous mothers [7]. Joshi et al found first and over fourth parity having high prevalence rate [8]. LBW prevalence was higher in female (17.8%) than male (13.1%). Amosu *et* al also found similar finding in their study [9].

Conclusions

All considered maternal and fetal factors were significantly associated with LBW. Reductions in teenage, elderly pregnancy and above 6th parity are essential for reducing LBW. Since there is a significant different in LBW between two ethnic groups, study of socio-economic factors should be taken into consideration.

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Suicidal poisoning in Batticaloa District: An analysis of admissions and outcome

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(Key words: Poisoning, Suicide, Batticaloa)

Abstract

Objective To determine the socio demographic factors, methods, treatment and outcome of patients with suicidal poisoning admitted to single medical unit, Teaching Hospital, Batticaloa.

Methods Data were collected by interviewer administered questionnaires from all patients with suicidal poisoning admitted to single medical unit during the period 1st December 2011 to 31st May 2012. Data were analyzed using the SPSS analytical package.

Results Seventy two out of 120 victims were females and 61.6% were in the 20-29 years age group. 78 victims were unmarried. Most had courtship failure (n-45, 37.5%) for their suicidal attempts. Young girls (n-12) had previous attempted suicidal poisoning to threaten their partners. The strong family history of poisoning (n-32, 26.6%) influenced the people to select poisoning as the suicidal method. The Yellow oleander (50%), Cerberus Magus (3.3%), Organophosphate (30%), Kerosene oil poisoning (6.7%) and drug overdose (10%) were the encountered poisoning. The gastric decontamination (76%) was the principal method of treatment in most cases. Four victims ended up in death. Courtship failure, economical and marital problems were significantly associated with suicidal poisoning ($P<0.05$). The strong familial history and previous attempts of poisoning were significantly associated with suicidal poisoning ($P<0.05$).

Conclusions Poisoning was common among young, unmarried females. The Oleander poisoning was a very significant method of poisoning in Batticaloa. The courtship failure and marital problems were the main contributing factors. The previous and familial suicidal poisoning attempts led the victims to select poisoning as suicidal method.

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Introduction

Deliberate self poisoning is a major problem worldwide [1]. It is also a major cause for suicidal deaths in developing countries including Sri Lanka. Sri Lanka has a high incidence of suicide - at least 40 suicides per 100 000 population each year compared with 8 per 100 000 in the United. Kingdom, 12 per 100 000 in United States and 15.8 per 100 000 in Germany [2, 3]. Organophosphates, Yellow oleander seeds, drug overdose and kerosene oil are methods of poisoning among Sri Lankan population. A leading method of committing suicide in Sri Lanka is ingestion of pesticides, which are readily available in rural farming households [4]. The reasons for the poisoning epidemic in Sri Lanka are unclear. Sociologists have suggested that the young have few support systems and are unable to cope with societal and cultural demands [5, 6]. Batticaloa district houses a multi ethnical population with a diverse socio economic and cultural background. Therefore, identifying the socio demographic patterns and trigger events among the self poisoning patients in Batticaloa would help to get a better understanding of the problem.

Since Batticaloa Teaching hospital is the only tertiary medical unit in the district, most of the critical poisoning cases from all the hospitals in the district are transferred here. Most of the people are taking poisoning to threat others rather than killing himself or herself. Motivation of people is important to prevent the incidents of suicidal poisoning. Research works are important to find out the possible breaking barriers to prevent the incidents of poisoning in society.

Methods

Data were collected by interviewer administered questionnaires from all patients with suicidal poisoning admitted to single medical unit during the period 1st December 2011 to 31st May 2012.

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Ethical approval for the study was obtained from the Ethical Review Committee, Faculty of Health Care Science, Eastern University, Sri Lanka.

Data were analyzed using the SPSS analytical package. Differences between the two groups (patients with significant arrhythmia vs. patients with insignificant arrhythmia) were analyzed with pair-wise comparisons. Baseline results are presented as counts and percentages and as mean ± SD for continuous variables. A P value < 0.05 was considered significant.

Results

Seventy two out of 120 victims were females and 61.6% were in the 20-29 years age. 78 victims were unmarried. Tamils (n-105) and Muslims (n-15) were also involved. The suicidal ideas were common among Hindus (76.6%) compared Muslim population.

Courtship failure (n-45, 37.5%) was important reason for suicidal attempts in our study. Marital (17.5%), social (10%), economical (20%) and familial problems (8.33%) were also contributed for the suicidal attempts (Table 1).Young girls (n-12) had previous attempted suicidal poisoning to threaten their partners. The strong familial history of poisoning (n-32, 26.6%) influenced the people to select poisoning as the suicidal method.

The Yellow oleander (50%), Cerberus Magus (3.3%), Organophosphate (30%), Kerosene oil poisoning (6.7%) and drug overdose (10%) were the common encountered poisoning (Table 2). The gastric decontamination (76%) was the principal stay of treatment in most cases (Table 3). Most of the patients needed intensive care units for their specialized management including intubation & ventilation and temporary pacing.

Four victims ended up in death. Death was due to Yellow oleander poisoning due to lack of specific antidotes and temporary pacing. The uses of Yellow Oleander had a high morbidity among the victims.

Courtship failure Economical and marital problems were significantly associated with suicidal poisoning ($P<0.05$). The strong familial history and previous attempts of poisoning significantly associated with suicidal poisoning ($P<0.05$).The gastric decontamination was principal stay of treatment in most cases rather than specific antidotes and was also effective in most cases ($P>0.05$). The uses of Yellow Oleander had a high morbidity among the victims ($P<0.05$).

Discussion

In rural Sri Lanka, rates of suicide in 15–24 year old females were higher than rates in males of the same age [7]. Most of the acute poisoning cases in Sri Lanka were intentional (suicide) and occur among young adults, mainly males with 68% of intentional self poisoning due to ingestion of liquid pesticides [8]. Age specific pattern of self poisoning in rural Sri Lanka was similar to that in industrialized countries, with most cases occurring in young people, and the incidence peaked around age 15–25 years and then falls steadily with increasing age [4]. However, a number of important differences between Sri Lanka and industrialized countries, such as - Male patients outnumbered women by 1.35:1 which is the reverse of most other regions [1]. Young aged females were commonly encountered in poisoning in our study. 78 victims were unmarried.

The reasons for the poisoning epidemic in Sri Lanka are unclear. Most had courtship failure (N-45, 37.5%) for their suicidal attempts in our study. Sociologists have suggested that the young have few support systems and are unable to cope with societal and cultural demands [5, 6]. A prospective study carried out earlier that out of 97 consecutive admissions following self-poisoning to find out the factors determining the choice of poisoning agents revealed that easy availability of the agrochemicals together with the lack of knowledge regarding their lethality were the main causative factors determining the choice of poisoning agents [9]. Suicide attempts are the result of complex social and cultural dynamics (long standing personal conflicts with sociological implications) with certain social and familial expectations that are not easy to meet. In most instances family contexts of these individuals are disrupted, and they do not seem to have the necessary skills to deal with problems.

The substances used in fatal poisoning also vary with age and with gender. In Sri Lanka, Yellow oleander is most commonly used by people under 20 [7]. Paraquat is the common method in young people, whereas other pesticides (particularly organophosphates and non-paraquat herbicides) become more important after the age of 30 years [7]. A leading method of committing suicide in Sri Lanka is ingestion of pesticides, which are readily available in rural farming households [4]. However Yellow oleander poisoning was popular method of poisoning in Eastern Province, Sri Lanka. Organophosphate was second common type of poisoning.

All are much more difficult to treat than the medicines that are commonly used for self-poisoning in the West [7]. The gastric decontamination (76%) was the principal stay of treatment in most cases (Table 3). Most of the patients needed intensive care units for their specialized management including intubation & ventilation and temporary pacing.

The cost of treating self-poisoned patients in all of Sri Lanka in 2004 was estimated at US$ 866 304.The average total cost of treating a self-poisoned patient at the general hospital was US$ 31.83.The average total cost of treatment was highest for self-poisoning with pesticides (US$ 49.12) [10]. In 1995–1996, in one general hospital in Sri Lanka, 41% of bed occupancy on medical intensive care beds was for the treatment of pesticide poisoning. Poisoning was the main bed occupancy on medical intensive care beds in our hospital and one of the major expenditure in tertiary care hospital in Batticaloa.

Table 1: Ateiological factors associated with suicidal poisoning

Personal characteristics	n (%)
Courtship failure	45, 37.5%
Marital problems	21, 17.5%
Social problems	12, 10%
Economical problems	24, 20%
Familial problems	10, 8.3%
Chronic Diseases	8,6.8%

Table 2: Methods of suicidal poisoning

Types of poisoning	n (%)
Yellow oleander	60,50%
Cerberus Mangus	4, 3.3%
Organophosphate	36, 30%
Kerosene oil poisoning	8, 6.7%
Drug overdose	12, 10%

Table 3: Treatment Modalities of suicidal poisoning

Management	(n%)
Gastric Decontamination	92 (76%)
Antidotes	30 (25%)
TPM	02 (1.6%)
CCU Mx	20(16%)
PU Mx	15 (12.5%)
Ventilator Support	6 (5%)

The case fatality ratio for self-poisoning patients admitted to Sri Lankan secondary hospitals (9%) is much higher than in industrialized countries (e.g.0.5% in the UK). A significant number of deaths (52% of female deaths, 11% of all deaths) occur in women under 25 years. Some reasons for high mortality rates include the toxic nature of the substances involved, lack of antidotes, distances between hospitals and patients, and overburdened medical staff [11]. Most of the deaths were due to Yellow oleander poisoning due to lack of specific antidotes and temporary pacing in our study. The uses of Yellow Oleander had a high morbidity among the victims in our study.

Table 4: Outcome of suicidal poisoning

Outcome	n(%)
Death	4(3.33%)
LAMA	18(15%)
Cardiac Toxicity	40(33.3%)
Aspiration Pneumonia	7(5.83%)
Still Hospital	5(4.16%)
Ventilator Associated Pneumonia	1(.83%)

Since poison choice affects outcome, it is important to find out why people chose particular poisons in a region where so many die from self-poisoning [12]. Poisons are mostly chosen on the basis of availability, often at short notice. Yellow oleander was easily available poisonous seeds in rural areas of Batticaloa. The people in these areas have choosen it as poisonous methods for suicidal attempts. There is no evidence that people using highly toxic poisons make a more serious or premeditated attempt [13]. Four victims ended up in death (Table 4) mainly due to yellow oleander in our study.

According to the Annual Health Bulletin (2002) by Ministry of Health, Sri Lanka, self poisoning is the commonest cause of inpatient death in some rural Sri Lankan districts whereas it's a rare cause in the capital city- Colombo, possibly indicating the influence of socio cultural background [14].

Conclusions

Poisoning was common among young, unmarried females. The Yellow Oleander poisoning was a very significant method of poisoning in Batticaloa. The courtship failure and marital problems were the main contributing factors. The previous and familial suicidal poisoning attempts led the victims to select poisoning as suicidal method.

Recommendations

Problem-solving ability has to be promoted to reduce the rates of suicidal poisoning among young unmarried females in Batticaloa district.

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Breast diseases in Eastern Province: Clinical audit of breast clinic, Teaching Hospital, Batticaloa

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(Key words: Breast cancer, Benign breast disease, Batticaloa, Breast clinic)

Abstract

Introduction Breast diseases, particularly the incidence of breast malignancy is increasing in Sri Lanka. In this regard breast clinics gain importance in the management and screening processes.

Objective To find out the patterns of breast diseases in the breast clinic at tertiary referral centre, Teaching Hospital, Batticaloa.

Methods Data were collected from well documented clinical records during the period of 1st January 2011 to 31st December 2011 and analyzed using SPSS analytical package.

Results Out of 176 attendants, 80.6% had underlying breast disease. 122 (69.3%) patients presented with benign breast diseases. Among these, fibroadenoma and mastalgia were common (30.7%, 17.6% respectively). The remaining were breast cysts, lipomas and breast abscesses. 11% of total study population had breast carcinoma. Invasive ductal carcinoma was the commonest malignancy.

Conclusions This focused breast clinic has detected underlying breast diseases in majority of the clinic attendants. Most of the diseases were benign and malignancy has been detected in 20 patients.

Batticaloa Medical Journal 2014; **6** 36-38

Introduction

In response to quality specifications expected to deliver optimum services to patients, Ministry of Health has prioritized policies, strategies and activities related to prevention & management of non-communicable diseases (NCD) in Sri Lanka[1]. According to these policies, 'Specialized Breast

Clinic' is designed as a dedicated clinic for breast problems. Medical & nursing staffs are specially trained in providing services for breast problems and clinic has the facility for the timely access of radiological and pathological services for triple assessment [1].

As this is a dedicated clinic - not mixed with other diseases - a focused care is being provided. Patient waiting time is less and more time is spent by the trained medical personnel for each patients. Furthermore, this focused breast clinic helps to overcome the reluctance commonly seen in women in seeking medical help for breast related problems. Access to this clinic is facilitated by easy referral system such as self-referral, referral by public health midwifes and medical officers working in the peripheral hospitals etc. Patients having high risk factors for breast cancer are also encouraged to attend this clinic for early detection of breast cancer.

A weekly breast clinic is being conducted at Teaching Hospital Batticaloa since 2010. Eastern province of Sri Lanka consists of 1.5 million populations [2]. This retrospective study was designed to determine the clinical presentation, type of breast disease and outcome of a dedicated breast clinic at tertiary referral centre, Teaching Hospital, Batticaloa.

Methods

A retrospective audit was carried out in Breast clinic at Teaching Hospital Batticaloa, Sri Lanka from the period of 1st of January to 31st of December 2011. The data were retrieved from the well documented clinic records. The results were analyzed using SPSS software programme. Frequency table analysis and percentage distribution were carried out.

Results

Hundred and seventy six new patients were registered during this one year period. The age range was11 years to74 years. According to the presenting symptoms, out of this 176 patients, 128 (72.2%)] complained of breast lump. Patients who had breast lump together with associated features such as mastalgia, axillary lump, nipple discharge and ulcer are also included in this category. 34 patients (19.3%) presented with breast pain

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only. 6(3.4%) had nipple discharge only and one patient presented with retracted nipple. 5 (2.8%) were already diagnosed breast cancer patients attended this clinic for further follow up. Remaining 2 patients (1.1%) visited for screening purpose (Table 1). Out of 128 breast lumps, 52(40.6%) had fibroadenoma, 13 (10.2%) had breast carcinoma, 11 had breast cyst (8.6%), 7 had breast abscess (5.5%), lipoma was diagnosed in 8 patients (6.3%) and three patients had fat necrosis (2.3%). Haematoma, galactocele, gynaecomastia and duct ectasia were found each in one patient (0.8%). Remaining 30 (23.4%) patients did not have any breast diseases. Among the patients presented with breast pain only [34(19.3%)] (Table 1).25 (73.5%) complained non-cyclical mastalgia and 6(17.6%) had cyclical mastalgia, 2 patients had fibroadenoma and one had breast cyst. Out of the six patients (3.4%) presented with nipple discharge two had breast carcinoma, three had benign diseases and there was no underlying breast disease in the remaining patient.

According to the final diagnosis, out of this total 176 patients, 142 (80.6%) were diagnosed to have underlying breast diseases. Lesions were not detected in the remaining 34 (19.4%). Among the patients who had breast lesions (142), 20 (11.4%) had carcinoma of the breast and benign breast diseases were detected in the remaining 122 (69.3%). According to histopathological study of the breast cancer, invasive ductal carcinoma was found in majority of patients (13 out of 20 patients - 65%). Ductal carcinoma insitu was seen in one (5%). According to age category 10(55%) patients with breast carcinoma were above the age of fifty years, remaining 11 (45%) were below the age of 50(Table 2). Fibroadenoma was the commonest benign breast lump identified in this study population (54 patients, 30.7%) Mastalgia (31 patients, 17.6%) was the other common diagnosis in this benign category (Table 3).

All patients were investigated following clinical evaluation (history and examination). Triple assessment, imaging studies and cytohistological investigations were performed in appropriate patients.

Out of total study population (176), 95 patients required USS imaging of the breast. 32 needed mammogram and histological assessment, 48 required fine needle aspiration and 16 had undergone core biopsy to confirm diagnosis. The breast cancer patients were managed with modified radical mastectomy with axillary clearance. The patients presented with mastalgia were managed conservatively with simple analgesia and other supportive treatment. Most of them responded well to the treatment. 20 out of 54 petients with fibroadenoma (37.1%) underwent lump excision. The remaining 34 (62.9%) were managed conservatively and advised to follow the breast clinic. The women who had no underlying breast diseases (34, 19.3%) were reassured, educated on breast self-examination method and discharged from the clinic.

Table 1: Presenting symptoms

Symptoms	Frequency	(%)
Breast lump	128	72.7
Futher follow up	5	2.8
Retracted nipple	1	0.6
Screening	2	1.1
Breast pain	34	19.3
Nipple discharge	6	3.4
Total	176	100.0

Table 2: Age distribution of Breast cancer

Age(yrs)	Frequency	(%)
31-40	3	15.0
41-50	6	30.0
51-60	6	30.0
61-70	4	20.0
71-80	1	5.0
Total	20	100.0

Table 3 :Diagnosis in details

Diagnosis		Frequency	(%)
Valid	breast cancer	20	11.4
	breast cyst	12	6.8
	fibrocystic disease	1	.6
	ductectasia	2	1.1
	gyanaecomastia	1	.6
	haematoma	1	.6
	fibroadenoma	54	30.7
	cyclical mastalgia	6	3.4
	non cyclicalmastalgia	25	14.2
	breast abscess	8	4.5
	no disease	34	19.3
	fat necrosis	3	1.7
	lipoma	8	4.5
	galectocele	1	.6
	Total	176	100.0

Discussion

The breast clinic at Teaching hospital Batticaloa is being conducted as an outpatient clinic. Being a tertiary referral hospital, patients are referred to this clinic from other outpatient clinics, base hospitals, MOH office (medical officer of health) and private sectors in Eastern province. During the one year study period 176 new patients were registered in this clinic.

With regard to the presenting symptoms, breast lump is the common presentation. Second common presentation is mastalgia. Many women with mastalgia are anxious about cancer than about the pain itself. Mastalgia is a symptom and is not a specific disease [3]. This study finds that non-cyclical mastalgia (14.2%) is more common than cyclical mastalgia (3.4%). This is not comparable with a study performed in university of Mosul, which shows cyclical breast pain (62%) is common [4].

Among the total study population, eighty percentage of patients required medical attention for their breast diseases and rest of them had no underlying breast diseases. Sixty nine percent had benign breast diseases. This finding is comparable with an audit done at one-stop breast clinic in St Bartholomew's Hospital, West Smithfield, and London. This study shows a total of 86% of the work load is benign [5]. Among the benign breast diseases, fibroadenoma is the commonest lesion in our study however in contrast to our study but this finding is not comparable with a study conducted at Karachi which shows fibrocystic disease is the commonest pattern of benign breast disease in female [6].

Eleven percent of the clinic attendance had malignant disease. When cancer is concerned, early detection and treatment is the most important aspect in reducing the mortality. It has been estimated that over 508 000 women worldwide died in 2011 due to breast cancer [7]. Almost 50% of breast cancer cases and 58% of deaths occur in less developed countries [8]. Breast cancer is increasing particularly in developing countries where majority of cases are diagnosed at late stages [9]. Breast cancer has a very high incidence among females in Sri Lanka also [3]. According to the cancer surveillance information in Sri Lanka, increasing trend is identified among females. (Age standardized incidence rate of 18.4 /100,000 in year 2005 to 18.8/100 000 in year 2007) [3].

The occurrence of breast cancer in female is strongly related to age with the highest incidence commonly seen in the older women. According to cancer statistics in UK 80% of breast cancer patients were over 50 years Only 20 % were less than 50 years old [10]. In contrast, this audit shows that 55% of breast carcinoma patients were more than 50 years but 45% of the patients with carcinoma were less than 50 years old.

Conclusions

As the breast cancer is the commonest malignancy among Sri Lankan women, importance of a breast clinic is being highlighted. The breast clinic is more useful for early diagnosis, screening and treatment of breast diseases in a focused and dedicated manner. Majority of the clinic patient had breast diseases. Most of them had benign lesions and malignenc has been detected in 11% of attendents.

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Brief review on applicability and importance of a surgical safety checklist

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(Index words: Surgery, Safety, Check list, WHO)

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Surgery plays a major role in the patient management and its scope continues to expand with the advancement of modern technology.

It is estimated that 234.2 million major surgical procedures are undertaken every year worldwide [1]. A research done in United States of America has revealed that annual incidence of complications among hospitalized patients who underwent an operation or child delivery was 3.0% (confidence interval 2.7% to 3.4%). Data suggest that at least half of all surgical complications are avoidable [2]. Hence it is of utmost importance to implement methods of minimizing or avoiding intra-operative and post operative complications. The frequency of and associated risk factors of post operative complications are poorly characterized in Sri Lanka up to date.

A study on personnel attitudes to a pre-operative checklist among surgeons, anaesthesiologists, theatre and anaesthetic nurses and nurse assistants showed that confirmation of patient identity, correct procedure, correct side and checking of allergies or contagious diseases were considered 'very important' by 78–84% of the responders [3].

Practice of ensuring the correct identity of the patient and site through pre-operative site marking and oral confirmation in the operating room may seem common place. However such steps have proved to be new to most of the hospitals in a global study done in hospitals in eight countries including Canada, India, Jordan, New Zealand, Philippines, Tanzania, England and United States of America [4].

In 2008, the World Health Organization developed a surgical safety checklist designed to improve team communication and consistency of care to reduce complications and deaths associated with surgery. Two controlled studies have confirmed that a thoughtfully constructed surgical safety checklist can achieve significant reduction in complications and deaths [5].

The use of WHO surgical safety checklist has lead to a reduction in the rate of complications at all levels from base line of 11% to 7% ($p<0.001$). The total in-hospital death rate has dropped from 1.5% to 0.8% ($p=0.003$). It has shown improvement in safety of surgical patients in diverse clinical and economic environments as well [4].

The WHO surgical safety checklist consists of three parts (Figure 1) and these components have to be completed before the patient is anaesthetised, before the skin incision is made and before patient leaves the operating room following recovery from anaesthesia [6].

Although use of a checklist is a tedious, time consuming task, researchers have found that team briefing based on a structural checklist can promote learning and create commitment to improve communication. This procedure incurs minimal resource expenditure and no loss of operating theatre time. In a study done in Canada, it has been shown that a routine team checklist briefing was feasible and had positive effects on team communication and team work [7]. Several papers related to errors and complications of surgical procedures have been reported in Sri Lanka [8]. In 2012, the Ministry of Health, Sri Lanka has introduced the Healthcare Quality and Safety Directorate to improve safety of patients [9]. Further researches and panel reviewes are needed to assess the effects and usefulness of WHO surgical safety check list to our local setting and to make amendments if appropriate.

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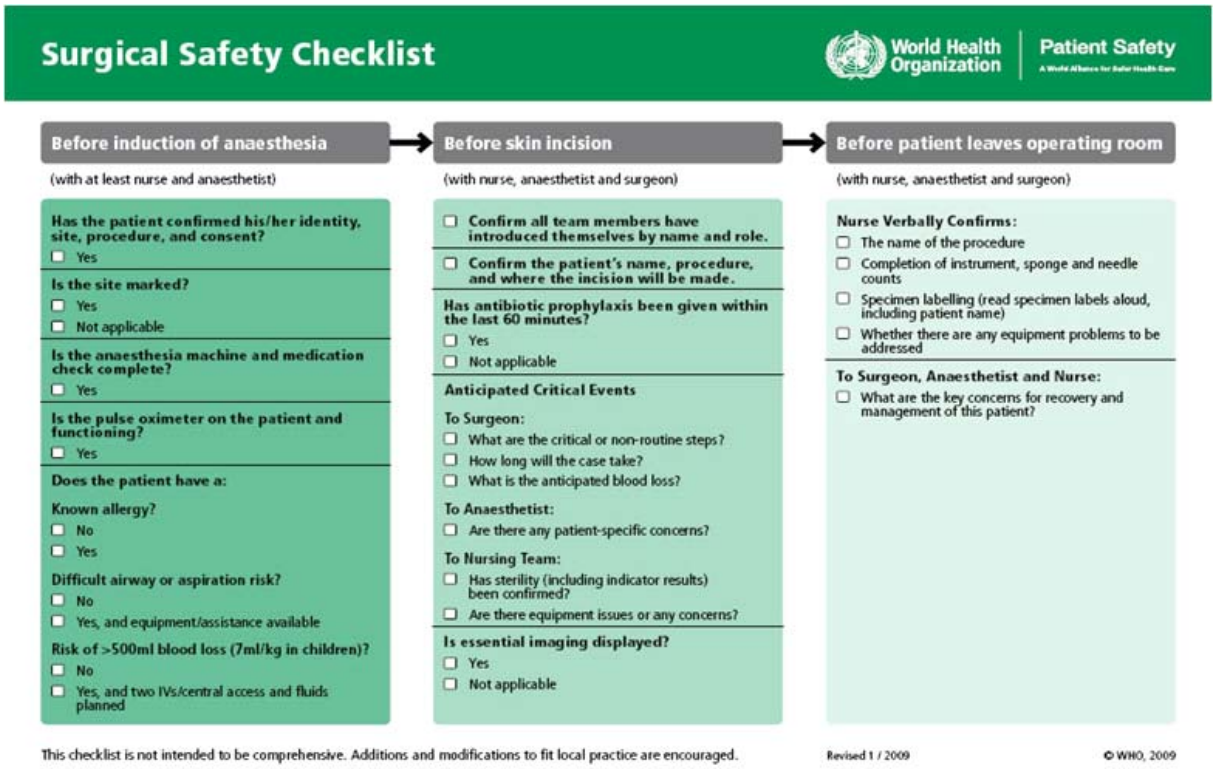
Figure 1: Surgical safety checklist of World Health Organization



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Torsion of caecal appendices epiploicae mimicking acute appendicitis

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Introduction

Appendices epiploicae are adipose structures protruding from the serosal surface of the colon. Approximately 50 – 100 is present normally and is arranged in two separate longitudinal rows extending from the caecum to the recto sigmoid junction. They are thought to have a protective function similar to that of the greater omentum containing any intra abdominal infection [1]. Epiploicae appendicae are supplied by one or two small end arteries branching from the long mesentric vessels of the colon and are drained by a tortuous vein passing through its narrow pedicle [2]. On abdominal radiography, computer tomography scan or ultrasound scan they appear as lobulated masses of peritoneal fat, usually 0.5 – 5cm long and 1 – 2cm thick, if intra peritoneal contrast material, ascites or blood surrounds the colonic wall. The use of intra peritoneal gas as a negative contrast agent is apparently inadequate for radiological demonstration. The radiological findings provide useful criteria for pre operative recognition of torsion, infarction and primary inflammation of appendices epiploicae [2].

Case report

A 41 year old man was admitted to the hospital with less than 1 day right lower abdominal pain. There was no history of nausea, vomiting or fever. He was a known patient with hypertension but not on treatment for more than 6 months. He was afebrile. The cardiac rhythm was 104bpm with the arterial blood pressure of 120/70mmhg. His abdomen revealed right iliac fossa rebound tenderness with guarding.The white blood cell count was 6,700/µl with 41% neutrophils and 57% lymphocytes. Haemoglobin level was 13.6g/dl and platelet count was 310 x 10^3/µl. Urine full report was normal. Ultrasound scan was not done.In view of his clinical picture a provisional diagnosis of acute apendicitis was considered and Appendisectomy was performed. Intra operative findings of appendicectomy were globular fatty tissue with necrosis attached to the caecum. Appendix was not inflamed. Appendisectomy and removal of fatty tissue piece were done. He was started intravenous Cefuroxime and Metronidazole with analgesics. Patient was discharged on post operative day 3.The histopathology showed haemorrhagic infarction of the Epiploic Appendage. It was a nodular adipose tissue surrounded by mesothelial lining. The fatty lobules revealed features of necrosis. Empty fat spaces and collections of foamy macrophages were seen. In addition fresh haemorrhage, thrombosis and vascular congestion were also evident. The appendix appeared normal.

Discussion

Acute torsion of an appendage usually manifests as localized abdominal pain in one of the lower quadrants as the sigmoid colon (commonly) [3] and caecum are the main site of involvement . But upper abdominal pain mimicking acute cholecystitis can occur if the right colon or transverse colon appendage is involved [4, 5]. It has been estimated that abdominal fat necrosis including omental torsion accounts for 1.1% of patients presenting with abdominal pain [6]. Mild fever and leucocytosis may develop with high neutrophils count but symptoms of nausea, vomiting and obstruction are infrequent [4]. These features occur in acute phase of torsion and will subside after several days and weeks. In such cases if surgery is not performed the infarcted appendage may undergo aseptic fat necrosis and gradually transformed into a fibrotic or calcified mass which attach to the colon or detach and remain mobile within the peritoneal cavity [1].

Appendices epiploicae torsion is a rare inflammatory condition occurring in adults mostly in the 3rd and 4th decade of life [3]. It is very rare in children under 19 years. Diagnosis of the epiploica appendage is much easy in adults than in children but it is rarely diagnosed preoperatively [3]. The disease can be rarely fatal, four deaths having been reported in the literature due to peritonitis and intestinal obstruction [2].

The radiological findings of caecal epiploic appendix torsion in adults have been well described in the literature as predictable and consistent [2]. Ultrasound reveals

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small, ovoid echogenic mass that is not compressible, located anterolateral to the right colon and anteromedial to the left colon [7]. A color Doppler sonograph may show spotty colour areas with arterial flow into the mass [2]. Computer tomography usually reveals oval or round shape, fat attenuation lesion along the antimesentric border of the colon, with periappendiceal fat stranding. There may be associated bowel thickening/ compression [7]. Laparoscopy may represent a valuable tool and an acceptable therapeutic alternative for both diagnosis and treatment of caecal epiploic appendix torsion [2, 6]. The most supported definitive treatment of acute appendices epiploicae torsion previously was surgical removal of the infarcted epiploic appendix results in cure, with no reported cases of recurrence [2]. Although conservative management with antibiotics and analgesics seems to be safe if diagnosed preoperatively [4,5].

Acute torsion of appendices epiploicae is a rare condition that can cause a diagnostic dilemma in a case of acute abdominal pain, particularly on the right lower quadrant, pretending as acute appendicitis. Conservative management with analgesia and antibiotics is usually safe if it is diagnosed pre operatively. In cases when the diagnosis is reached during operative exploration, the treatment is usually ligation and excision. Laparoscopy being the most useful tool because it offers correct diagnosis and treatment at the same setting.

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Rosuvastatin induced Rhabdomyolysis reported in Batticaloa

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Batticaloa Medical Journal 2014; **6**: 43-45

Introduction

Statins are the mainstay of dyslipidemia management for the primary and secondary prevention of cardiovascular disease.The use of statins in randomized trials has demonstrated 30% reductions in atherosclerotic end points without serious morbidity [1]. Rosuvastatin is a competitive inhibitor of the enzyme HMG-CoA reductase, having a mechanism of action similar, yet higher efficacy, to other statins [2]. The efficacy of rosuvastatin across its dose range of 10 to 40 mg is superior to that of other statins across their dose range,although the safety is similar [3]. Rosuvastatin 40 mg reduced LDL cholesterol levels by 54%, while it increased HDL cholesterol by 13% after 96 weeks [4]. Like other statins, rosuvastatin is associated with a spectrum of adverse events ranging from mild to life-threatening. The most severe adverse event is severe myopathy (ranges from myalgias to rhabdomyolysis), which can cause acute renal failure; this adverse event is usually associated with many risk factors. In this report we present a case of rhabdomyolysis induced by low dose of rosuvastatin (10 mg daily) in a 62-year-old Batticaloa man who had no obvious risk factor.

Case report

A 62 year-old man from Batticaloa was admitted to the medical ward with one week history of bilateral thigh back and shoulder pain and easy fatigability associated with passing dark urine for two days. He denied the consumption of grapefruit juice or alcohol abuse and he hadn't had any exercise before this episode. There was no family history of muscle disease. The patient had history of diabetes mellitus (DM) type II, hypertension and hypercholesterolemia. He had hypertension since for 20 years and diabetes mellitus for 5 years, hypercholesterolemia for 2 years and had been followed up regularly by his physician in the clinic. Current medications included metformin 500mg thrice daily orally (PO) and losartan 50mg once daily. His hypercholesterolemia was treated initially by atrovastatin 20 mg/ day for 2 years, but the patient was shifted to rosuvastatin 10 mg once daily PO during the last 2 months for better control of hypercholesterolemia. On examination the pulse was 84/min and the blood pressure 150/95 mmHg. His systemic examination reveals muscle tenderness in bilateral thigh. The rest of the examination was unremarkable.

Initial investigations showed hemoglobin level of 11.9 g/ dL, total leucocyte count 8700/mL and platelets, 479,000/uL; blood urea 147mg/dL, creatinine 2.4mg/dL, sodium 130.3 mEq/L and potassium 4.32 mEq/L, bicarbonate 23 mmol/L, Ca 2.3 mmol/L, blood sugar 130mg/dL. His myoglobin was elevated, 2694 ng/ml with a significant increase in urine myoglobin. The creatine kinase (CK) level was markedly elevated (21,210 U/ L).Aspartate aminotransferases (AST) was 89 IU/L, alanine aminotransferase (ALT) 60 IU/L and alkaline phosphatase 341 IU/L. Total bilirubin was 5mol/L, total proteins, 7.5 g/dL, and albumin, 4.0 g/dL, whereas PT and INR were normal. His fasting lipid profile was; total cholesterol, 208mg/dL; LDL cholesterol, 119mg/dL; triglyceride, 155mg/dL. His previous investigations during clinic follow up before starting rosuvastatin are within normal range. Rhabdomyolysis secondary to rosuvastatin now seemed to be the most likely diagnosis; accordingly this drug was stopped at time of admission and intravenous fluids (normal saline) given at 150 cc/hour with cautious monitoring of serum electrolytes. Other medications were resumed. On the following days the level of creatine kinase and serum myoglobin declined toward the normal value and consequently he was discharged 10 days after hospitalization without statins but on diet therapy. At the time of discharge, his baseline investigations are normal. On follow-up evaluation two months after discharge the patient was symptom free; laboratory evaluation yielded CK of 212 U/L, serum creatinine of 0.7mg/L and LDL cholesterol of 119mg/dL.

Discussion

Rosuvastatin is a relatively new cholesterol-lowering drug in Sri Lanka as well as in other countries; although highly efficacious, this new statin has generated considerable controversy regarding its safety. In Canada as well as United States, many cases of rosuvastatin induced rhabdomyolysis had been reported [5]. Like other statins, rosuvastatin can cause life threatening rhabdomyolysis (defined as muscle symptoms with marked creatine kinase elevation

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typically substantially greater than 10 times the upper limit of normal, with a creatinine elevation consistent with pigment nephropathy and usually with brown urine with myoglobinuria) [1]. Our patient presented with bilateral thigh back and shoulder pain and easy fatigability associated with passing dark urine. His serum creatinine was higher than the baseline and his CK was greater than 20 times the upper limit of normal. The incidence of rosuvastatin- induced rhabdomyolysis is not known exactly but it was presumed to be low [6], and similar to atorvastatin, pravastatin, and simvastatin [6]; to our knowledge this is the first reported case in Batticaloa. Although statin induced rhabdomyolysis had been reported at rates of 1 death per 6.6million prescriptions [7], no deaths related to rosuvastatin induced rhabdomyolysis were reported in the literature [6]. Heerey *et al.* [8] estimated that approximately 30% of all users of statins have concomitant prescribed drugs that can inhibit statin metabolism by hepatic cytochrome P450 (CYP) system, potentially leading to rhabdomyolysis. Rosuvastatin is not metabolized by means of cytochrome P450 (CYP) 3A4, but it is minimally metabolized in the CYP2C9 isoenzyme pathway and to lesser extent in the CYP2C19 isoenzyme pathway [9]. In addition, rosuvastatin does not have any inhibitory or inducing effects on the CYP system. Thus, CYP isoenzyme inhibitors, including erythromycin, itraconazole, Amiodarone and ketoconazole, do not substantially affect rosuvastatin metabolism. The most common drug interactions of rosuvastatin are with the following drugs: cyclosporine , Gemfibrozil , warfarin , oral contraceptives and antacid containing magnesium or aluminum hydroxide ; these interactions are not related to the CYP system. Thus, concurrent use of these drugs with rosuvastatin should be with caution. None of these medications were used by our patient. The factors that increase the risk of rosuvastatin induced myopathy or rhabdomyolysis include increased age, renal impairment, hypothyroidism, personal or family history of hereditary muscular disorders, previous history of muscular toxicity with another statin or fibrate, consumption of grapefruit juice (more than 1 L per day), alcohol abuse, being of Chinese or Japanese descent, concomitant use of fibrates. This group of patients should be given rosuvastatin with caution [5]. Our patient had no obvious risk factor; he was 62 years old and non alcoholic and nonsmoker; his baseline creatinine was normal and the calculated creatinine clearance was normal. Rosuvastatin should be discontinued in patients with a creatine kinase level of more than 10 times the upper limit of normal range with or without muscle symptoms [5]. Rosuvastatin is contraindicated in individuals with a known hypersensitivity to the drug and in those with active liver disease or unexplained persistent elevations in liver transaminases levels (> 3 times the upper limit of normal range on two consecutive visits). Liver transaminase levels should be assessed at baseline, at 12 weeks after the start of therapy or an increase in dose, and at 6-month intervals thereafter. The dosage should be reduced or therapy withdrawn if liver transaminase levels exceed 3 times the upper limit of normal range. Because of the potential for rosuvastatin to increase liver transaminase levels, it should be used with caution in patients with a history of liver disease or alcohol abuse [10]. Overall, persistent elevations in liver transaminase levels are reported in 0.1-0.4% of patients taking rosuvastatin 5-40 mg [10]. Similarly, our patient showed high transaminase level which was returned to normal after discontinuation of the drug. Although the exact mechanism of statin-induced rhabdomyolysis is unknown, the implicated mechanisms include the followings: first, the cholesterol synthesis blockage; which makes the skeletal muscle-cell membranes unstable due to low cholesterol content [11]. Second, prenylated protein abnormalities causing imbalances in intracellular protein messaging [12]. Third, coenzyme Q10 deficiency causing abnormal mitochondrial respiratory function [13]. Rosuvastatin induced rhabdomyolysis in this patient is supported by the following: first, among the drugs used by the patient, there was no drug that known to cause rhabdomyolysis; second: myoglobin and CK were washed out from the blood and returned towards normal within few days after discontinuation of rosuvastatin. In conclusion, although highly efficacious, rosuvastatin has generated considerable controversy regarding its safety; clinicians should maintain an increased level of awareness of the potential for muscle toxicity and rhabdomyolysis, which is associated with this new drug. Accordingly, emergent myalgias in patients under rosuvastatin necessitate immediate testing of creatine kinase and myoglobin to exclude life threatening rhabdomyolysis.

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Boerhaave's syndrome: Conservative management followed early diagnosis

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Introduction

Boerhaave's syndrome (BS) is a rare and often fatal condition characterized by spontaneous oesophageal rupture. It results from sudden increase in intra-oesophageal pressure combined with negative intra-thoracic pressure caused by straining or sudden violent vomiting against a closed glottis [1]. Meckler's triad of vomiting, pain and subcutaneous emphysema are characteristic features of BS [1]. The nonspecific nature of the symptoms may contribute to a delay in diagnosis and a poor outcome [2]. In most cases, the tear occurs at the left postero-lateral aspect of the distal oesophagus and extends for several centimeters proximally [3]. BS is associated with high mortality and morbidity in the absence of proper management.

Case report

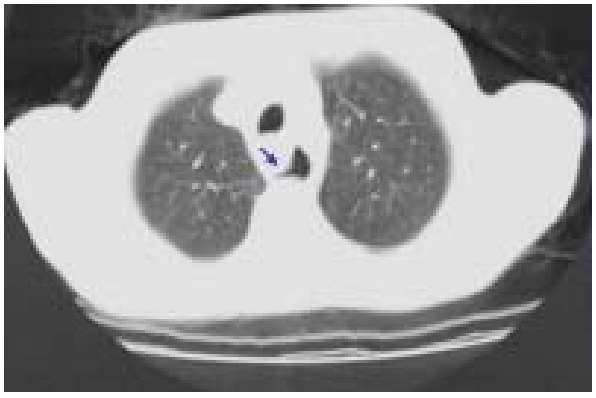
A 74 year old previously healthy Sri Lankan lady, presented to the Emergency unit with sudden onset of severe chest pain and difficulty in breathing after violent vomiting .On examination, she was in distress, dysphonic, afebrile.Her blood pressure was 140/90. Breath sounds were reduced on left side of the chest.Urgent chest film showed pneumomediastinum and left side pleural effusion with subcutaneous emphysema [Figure1].

Later CT-thorax confirmed a perforation at the left posterior aspect of mid oesophagus [Figure2]. She was diagnosed as having Boerhaave's syndrome. Conservative management was planned considering her stable general condition, early diagnosis and absence of sepsis or malignancy. She was managed her with tube thoracostomy, intravenous fluids, broad spectrum intravenous antibiotics (Imipenem), nil by mouth and frequent nasogastric suction. After 3 days, a feeding jejunostomy was done for the purpose of enteral nutrition. She clinically improved after 3 weeks of inward management.

The repeat contrast oesophagogram showed minimal leakage with reduced size of perforation. She was discharged with drainage bag attached to the thoracostomy site and feeding jejunostomy for enteral nutrition at home. She was followed up regularly with 2 monthly contrast oesophagogram. Six months after the initial presentation, oesophageal rupture site healed with a small diverticulum and the thracostomy site too was completely healed.

Figure 1 (CXR): Pneumomediastinum & L/S effusion with subcutaneous emphysema

Figure 2 (CT-thorax): A perforation at the left posterior aspect of mid oesophagus



One week after the radiological confirmation of healing of oesophageal rupture oral feeding was started. Patient tolerated the oral feed well. Subsequently feeding jujunostomy was removed and patient recovered completely.

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Discussion

Boerhaave's syndrome accounts for 15% of rupture or perforation of the esophagus. Overall mortality rate is approximately 30%. Most surgeons believe that surgical intervention gives good outcome than conservative management [4]. Specific surgical technique (primary repair, stent and resection) depends on the extent, time of injury and location of the perforation.
Emerging evidence indicates that patients with small well-defined tears and minimal extra oesophageal involvement may be better managed conservatively [5, 6]. This was possible with our patient. .

Early diagnosis or delayed diagnosis with contained leak; tear outside abdomen-contained to mediastinum; no neoplasm or obstruction; no signs or symptoms of sepsis favours conservative management [6]. This includes immediate broad-spectrum intravenous antibiotic therapy to prevent mediastinitis and sepsis, intravenous fluid therapy to replace the fluid loss since oral rehydration is impossible, nil by mouth and placement of nasogastric tube to clear gastric contents and to limit further contamination. Thoracostomy may be used to decompress the chest.

Early diagnosis, stable general condition, tears outside the abdomen, no distal obstruction and no features of sepsis favoured the conservative management in our patient. Although a contained oesophageal rupture to mediastinum would have been ideal, our patient had a left sided pleural effusion. This may have contributed to the delayed healing of the oesophageal rupture. Upper gastrointestinal endoscopy with endoscopic clipping in a well trained hand is the other alternative that practiced in some centres [5].

Even though Boerhaave's syndrome is generally considered to have poor prognosis without surgical treatment, this case has shown with early diagnosis and appropriate selection of patient, conservative management would be an effective alternative.

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Pancreatic pseudo aneurysm presenting as haematemesis

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Batticaloa Medical Journal 2014; **6**: 48

Introduction

Pancreatic pseudo aneurysm is a permanent communication caused by an erosion of pancreatic or peri pancreatic artery into a pseudo cyst [1]. Diagnosis remains challenging due to the rarity of this condition and non specific symptoms [2]. Pancreatitis with pseudo cyst formation is the most common cause of pancreatic pseudo aneurysm, although it is known to occur following Biliopancreatic or pancreatic resection for malignancy, pancreatic transplant and blunt or penetrating abdominal trauma[3].

Case Report

A 34-year- old male presented with a history of epigastric pain, episodes of haemataemesis and malaena of three months duration. He had a past history of two episodes of hospital admission for acute on chronic pancreatitis. He was heavy alcoholic for 10 yrs. Examination revealed severe pallor and mild epigastric tenderness His BMI was 15. Haemoglobin was 4.4g/dL. Ultrasonography showed pancreatic enlargement and calcification. Both upper and lower endoscopy were normal . CT abdomen with mesenteric angiogram revealed 2cm × 2.5cm aneurismal filling in the pancreas. Surgical exploration revealed fibrosed pancreas with fragile bloods vessels. An aneurysm was indentified in the body of the pancreas and the feeder artery was ligated successfully. Pancreatic aneurismal cavity anastamosed with posterior wall of the stomach. Patient post op was uneventful with one day of ICU observation. He was symptom free and his haemoglobin remained within normal range after 3 months.

Discussion

Most patients with visceral artery pseudo aneurysm are asymptomatic, but life threatening bleeding can occur. High index of suspicion is needed to diagnosis this condition when patient present with non specific symptoms. Competent interventional radiological procedure is required to confirm and plan the management [4]. The wide range of treatment options are available ranging from minimally invasive endovascular coil embolization [5] to open surgery. Haemorrhage is the a main complication, it has the mortality of 13%-40% [6]. It is almost always fatal if it is left unattended. Mortality rate following surgical treatment of pancreatic pseudo aneurysm is primarily dependent on the anatomical location. Pseudo aneurysm of pancreatic head carries 43% but only 16% when it is in the body or tail of the pancreas [7]. In developed countries these are managed by interventional radiologist. But in the Sri Lanka, experienced general surgical team is usually involved in the management.

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Fungal orbital syndrome in a diabetic man

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Introduction

Sino-orbit cranial aspergillosis manifests with fever, sino-orbital pain and headache [1]. We reported a case of fungal orbital syndrome involving the sinuses with orbital and retrograde intracranial extension (3^{rd},4^{th},5^{th},6^{th} and 7^{th} cranial nerves) causing complete ophthalmoplegia, hemifacial palsy.

Case report

A 60-year old man presented with sudden onset of visual loss associated with pain and paralysis of the ocular muscles of both eyes and right-sided facial weakness, preceded by fever, cough, cold, and headache of four weeks. He had type II diabetes mellitus for 4 years and hypertension recently.

He was afebrile, with chemosis, complete ophthalmoplegia, bilateral ptosis and ipsilateral lower motor neuronal facial palsy. The pupils were bilaterally dilated. Ophthalmoscopic examination revealed bilateral optic atrophy, upward gaze restricted and right lateral gaze is restricted. Bilateral 2^{nd}, 3^{rd} and 6^{th} nerve palsieswere noted. ESR and CRP were with high neutrophil Leucocytosis. Initial MRI brain done with orbits was suspicious of pansinusitis and preseptaland retro orbital cellulitis. CT-PNS showed bilateral maxillary and ethmoidal sinusitis. MRI with both orbits and sinus done on two months later compared with previous MRI showed extensive mucosal thickening of maxillary,ethmoidal and frontal sinuses with extension of inflammatory process in right periorbital soft tissue, bilateral orbital apex and perioptic space, right infraorbital region involving infraorbital nerve extending along maxillary division of 5^{th} nerve proximally along pterygomaxillary fissure and infraorbital fissure and extending into meninges over carvenous sinus and petrous apex on right side with involvement of 3^{rd}, 4^{th}, 6^{th}, 7^{th} and branches of 5^{th} cranial nerves probably consistent with fungal etiology; orbital inflammatory syndrome. Chest radiograph was also normal. Blood picture was suggestive of an infectious/inflammatory process. Pansinus biopsy showed chronic inflammation with fungal infection. Broad spectrum intravenous antibiotics, intravenous Amphotericin, steroids and cyclophosphamide were commenced. Histology of sinus mucosa showed inflammatory changes on H & E staining and fungal staining with methenamine-silver unmasked aspergillosis. Intravenous amphotericin B was commenced and he developed a prerenal azotaemia during the course of treatment with Amphotericin continued beyond two weeks until complete clinical and radiological resolution occurred in spite of nephrotoxicity. However vision and eye movements were not improved. Sinus biopsy specimens sent for fungal culture didn't yield any fungal growth. Good glycaemic control was achieved with the help of diabetologist. ENT surgeon and Ophthalmologist were involved in the management of this patient. Post-treatment imaging confirmed complete radiological resolution of the pathology. He was counseled regarding the permanent nature of the disabilities of his eyes.

Discussion

Visual loss from optic neuropathy and ophthalmoplegia involving multiple cranial nerves are the hallmarks of an orbital apex syndrome. Historically, the terms superior orbital fissure, orbital apex, and cavernous sinus have been used to define the anatomic locations of a disease process. Our patient had these typical characteristic clinical findings [2].

Orbital apex syndromes may result from a variety of inflammatory, infectious, neoplastic, iatrogenic/ traumatic, and vascular conditions. A detailed history with review of systems is important in narrowing the differential diagnosis. Management is directed at the underlying cause and may be guided by biopsy. Corticosteroids may be useful if an inflammatory etiology is suspected, but should be used with caution.

An orbital apex syndrome (OAS) has been described previously as a syndrome involving damage to the oculomotor nerve (III), trochlear nerve (IV), abducens nerve (VI), and ophthalmic branch of the trigeminal nerve (V1) in association with optic nerve dysfunction. Our patient had all the cranial nerves involvement. The

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cavernous sinus syndrome (CSS) may include the features of an OAS with added involvement of the maxillary branch of the trigeminal nerve (V2) and oculosympathetic fibers [1]. Cavernous sinus lesions are also more commonly bilateral. Visual loss and ophthalmoplegia are often the initial manifestations of an OAS. Our patient was initially presented with these symptoms.

Infectious diseases involving the central nervous system, paranasal sinuses and periorbital structures may lead to an OAS. These include fungal organisms such as *Mucormycosis* [2, 3]and *Aspergillosis* [4, 5], bacteria [6] and syphilis [7]. The etiology of this patient is *Mucormycosis*. Early identification of an infectious cause is paramount, because failure to recognize these conditions may be fatal. *Mucormycosis* and *Aspergillosis* should be suspected in individuals with predisposing conditions including diabetes mellitus, alcoholism, hematologic malignancies, and immunosuppression [2]. This patient had predisposing factor; Diabetes mellitus. A fungal cause should be considered in any patient requiring immunomodulatory, antineoplastic, or long-term corticosteroid therapy. However, *Aspergillosis* and *Mucormycosis* have been reported in immunocompetent individuals as well [5, 8]. Although fungal infections of the orbit and paranasal sinuses may present with pain, local tissue invasion and necrosis, and typical radiographic findings, they may also occur without pain and in an insidious fashion, making the diagnosis more difficult. Otolaryngologic consultation may be helpful to identify and to sample areas of tissue necrosis if the cause of an orbital apex syndrome is unclear [3].

Treatment of acute fulminant invasive fungal orbital syndrome involves surgical resection of the infected sinus and systemic antifungal agents [9]. Prognosis is poor and recurrences are common in the invasive fungal orbital syndrome .In our case the patient's condition did not improve despite sinus drainage surgery and systemic amphotericin.

We shoulder consider the Fungal orbital syndrome as first differential diagnosis in patient presenting with visual loss and ophthalmoplegia involving multiple cranial nerves; the hallmarks of an orbital apex syndrome. We should suspect fungal infection as etiology among those with diabetes mellitus. Early identification of an infectious cause is paramount, because failure to recognize these conditions may be fatal.

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Recurrent forehead Basal cell carcinoma; Reconstruction with scalp flap

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Batticaloa Medical Journal 2014; **6**: 51-53

Introduction

Basal cell carcinoma (BCC) is the most common malignant skin tumor [1, 2]. Risk is related to skin type and the degree of exposure to sunlight, particularly ultraviolet B radiation [1]. It has a particular predilection for the upper two thirds of the face [2]. BCC is a heterogeneous, usually slow growing tumour with less metastatic potential [4, 5]. Local destruction, disfigurement and recurrence may occur if left untreated or incompletely removed [6, 7]. Aggressive subtypes are infiltrative (sclerosing and non sclerosing) and micronodular BCC [4]. These carcinomas have a high probability of occult spread and recurrence.

Case Report

A 65-year-old gentleman presented to the oncosurgical unit with a recurrent forehead lump. He has had two previous surgical excisions within two and a half years period The previous histology revealed BCC. Clinical examination showed a 3 cm x 2 cm, hemispherical, bony hard mass firmly attached to the scalp at the surgical scar (Figure 1).Computed tomography imaging excluded underlying frontal bone erosion. There was no evidence of lymphnode or distant metastasis. Wide local excision of the tumor with underlying pericranium was performed. Histopathology revealed sclerosing type basal cell carcinoma infiltrating the underlying pericranium as well as the peripheral surgical margins. Perineural invasion was present (Figure 2). Subsequently, wide excision of the lesion which included the underlying frontal bone was performed. The defect was closed with the scalp flap based on the left superficial temporal artery. A split thickness skin graft was applied to the donor site. Surgical site appeared completely healed with satisfactory cosmetic outcome. Microscopic examination of the re excised specimen did not reveal residual malignancy. There was no evidence of tumour recurrence at sevenenteen months after the surgery. Patient is being kept under close follow-up.

Discussion

BCC is a slowly growing neoplasm causing local destruction. Consequently, the usual treatment modalities are local and consist of surgical excision, cryosurgery, Mohs microsurgery, curettage, electro dessication or radiotherapy [8]. The aims of any therapy for the treatment of a BCC are to ensure complete removal, preservation of function and good cosmetic outcome [9].

The location, histological subtype and size of the lesion have prognostic effects on the recurrence rate. Aggressive forms of BCC may recur. Rippey has described four different subtypes of BCC such as nodular including micronodular type, infiltrating including sclerosing and non sclerosing types, superficial and mixed types [3]. Infiltrating and micronodular subtypes of BCC, especially if located on the face, have a higher risk of recurrence [10] Flat lesions, lesions that are not well circumscribed, perineural invasion are associated with a greater likelihood of local recurrence. [8, 11] Most recurrences (two-thirds) occur during the first three years [8]. However, they may occur between 6 months to 10 years after treatment. In spite of the high incidence of BCC, the exact rate of its recurrence is not known [9].

Assessing the surgical margins intra operatively using frozen sections is the ideal set up that make sure complete excision of the lesion. It has been a common practice to employ a 5 mm margin for excision. Lalloo and Sood reported that an excision margin of 2 mm was adequate for the treatment of simple, well-demarcated BCCs arising in the head and neck except for recurrent or morpheaform tumors [12].

Intra operative margin status was not evaluated in this patient due to non-availability of frozen section facility. Subsequently bad prognostic factors such as sclerosing type BCC, perineural invasion and involved and close surgical margin were identified. Therefore reexcision of

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Figure 1. Clinical picture shows basal cell carcinoma presenting as hemispherical, bony hard mass firmly attached to the scalp at the surgical scar.

Figure 2.Photomicrograph of the forehead lesion shows sclerosing basal cell carcinoma with perineural invasion (Black arrow).

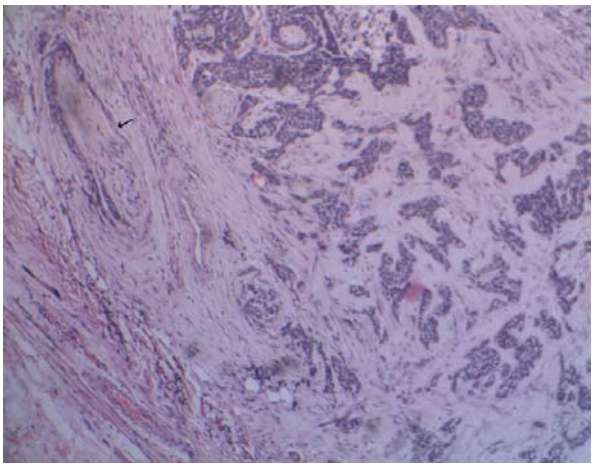

Figure 3. Clinical picture shows appearance following wide local excision and reconstruction with flap

the previous tumour site with underlying portion of frontal bone was performed. This surgical option was planned considering the hairline, eyebrow, and orbit. Scalp flap was chosen to reconstruct the defect.

Compared to the ordinary basal cell carcinoma recurrent BCC have to be evaluated carefully before the intervention. Surgical resection with adequate margin is the best possible treatment. Local scalp flap is useful option to cover the defect and to achieve good cosmetic results. Regular follow up is mandatory.

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The mysterious singer of Batticaloa

A Parthiepan[1]

It is a well-known fact that a song is perceived in the Batticaloa lagoon by night, especially on full moon days. There are various opinions given as to the singer of this song. Singing fish is a fascinating wonderful phenomena thought to be related to this song. Who does exactly sing this melodious song? Hon. Prince G. Casinader, a well-respected senior citizen, former Principal, Methodist Central College, Batticaloa, former member of parliament was interviewed regarding this. Mr.Casinader has many different calibers in his life.

Mr.Casinader said that this music is not confined to a particular season and is best heard on a full moon night, when the atmosphere is quiet and not noisy. He continued in order to hear this music you have to go by a boat near to the Elephant rock and plunge an oar into the water and keep the other end to the ear. Mr.Casinader recalled that there are several people, who at first hand categorically state, that have personally heard the musical sounds. A among them is Sir Emerson Tennent, former colonial secretary of Ceylon, and MP of England Parliament. Mr. Casinader kindly requested the young generation, far from being only engrossed, parochially, within the limited syllabus of strictly limited studies, should welcome range of studying wider limits. He said "definitely there is music. You must go there and listen". He concluded by saying that up to date, it has not been established that it is fish that provide the musical sounds.

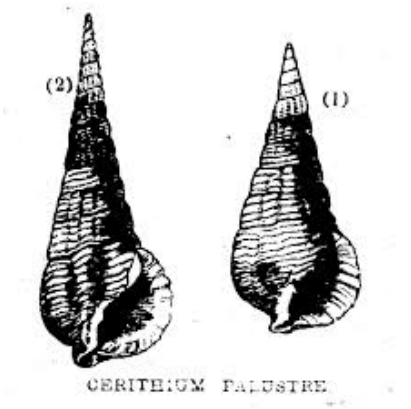
In fact many papers have been published by enthusiastic nature loving investigators in the past. Their ultimate quest is to find out the singer of Batticaloa lagoon.

Shell as the singer

The documented information regarding the singing fish can be traced from 19th century. Sir J. Emerson has mentioned in his book that, during his visit to Batticaloa in 1848 he was told by the local fishermen that the music is due to the sound produced by shell. This is known by the Tamil name of *oorie cooleeroo cradoo*, or the "crying shell" [1]. *Cerithium lividulum* is the scientific name for this shell (Figure 1).

Sir J.Emerson has described his experience in this way; "In the evening when the moon rose, I took a boat and accompanied the fishermen to the spot. We rowed about two hundred yards north-east of the jetty by the fort gate; there was not a breath of wind, nor a ripple except those caused by the dip of our oars when I distinctly heard the sounds in question. They came up from the water like the gentle thrills of a musical chord, or the faint vibrations of a wine-glass when its rim is rubbed by a moistened finger. It was not one sustained note, but a multitude of tiny, sounds, each clear and distinct in itself; the sweetest treble mingling with the lowest bass.

Figure 1. ***Cerithium lividulum***



On applying the ear to the woodwork of the boat, the vibration was greatly increased in volume. The sounds varied considerably at different points, as we moved across the lake, as if the number of the animals from which they proceeded was greatest in particular spots; and occasionally we rowed out of hearing of them altogether, until on returning to the original locality the sounds were at once renewed.

This fact seems to indicate that the cause of the sounds, whatever they may be, is stationary at several points; and this agrees with the statement of the natives, that they are produced by shells and not by fish.

However subsequent investigators further studied this mysterious music and obtained a different suggestion in contrast to the shell theory.

Fish as the singer

It is now a known fact that fishes produce different types of sounds using different mechanisms and for different

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reasons. Sounds may be produced intentionally as signals to predators or competitors, to attract mates, or as a fright response or unintentionally as a by-product while feeding or swimming. There are three main ways of sound production. These are by using sonic muscles that are located on or near their swim bladder; striking or rubbing together skeletal components; and by quickly changing speed and direction while swimming. The swim bladder is a large chamber of air located in the abdominal cavity in most bony fishes used primarily for regulating buoyancy. Drumming of the swim bladder with the sonic muscle is the best-known sounds produced by fishes [2].

Rever. Fr. Lange in his article (3) regarding the singing fish of Batticaloa has discussed about the history of the singing phenomenon, condition of audibility, possible explanation of the sounds and fish as a producer of the musical sounds. He concludes that the fish undoubtedly can sing or, at least, can produce sounds of a very wide variety, since we are certain that fish are capable of producing sounds. He has also mentioned that a Batticaloa phenomenon has a striking feature that seems almost to defy explanation: namely, that the sound can be heard clearly by the unaided ear above the surface of the water and well above it.

C. Brooke Elliot has explained some of his experiences in "The Real Ceylon" published in 1938. Brooke has stated that "Batticaloa is famous for its so called singing fish – though science has not yet solved the problem as to which fish exactly causes this euphonious phenomenon". Brooke further elaborates that the "noise is like a blend between the croak of a bull frog and a Jew's harp" [4].

Subsequently S.V.O Somanader famed naturalist, Fellow of the Zoological Society of London, a member of the Royal Geographical Society and the Royal Society of Teachers has published an article " Batticaloa's Singing Fish – Fish, not shells seem to be the author of the music " in the wild life journal Loris [5]. Here Mr. Somanader has amusingly elaborated about the fish which causes this music. Two interesting verdicts were discussed in this article. One is the underwater investigation done by Mr.Rodney Jonklass (professional diver). Mr.Jonklass's invaded the haunts of the singing fish with the help of face mask, fins and water proof electric torch. Jonklass informed Mr.Somanader that the fish fauna of lagoons is more or less the same all over, and nothing is peculiar in the Batticaloa lagoon. Interestingly, Jonglass noted that deeper he dived, the croaks became louder and right at the bottom curiously enough, there was no music at all. Mr.Somanader has stated that "this statement alone seemed to shatter the theory, that the singers are shells, simply because on previous occasions where strains were heard only at definitive spots or at particular times at the surface from the boat". Jonklass has also found musical notes which were distinct from croaks. He has mentioned it as a single note of rather medium pitch coming as from harp, or from the plucking of violin strings when tuning. Jonklass has given an opinion that the croaks were uttered by one kind of fish or more.

Mr. Somanader concluded his article by mentioning the second thought-provoking investigation done by Japanese fishing expert in 1961. They identified the singing fish of Batticaloa as *guchi* (Japanese name) which was similar to the fish found in Japan *Johnius dussumieri*. This fish belongs to Sciaenid species. There are many fishes belong to this species such as White croaker (*Genyonemus lineatus)* Figure 2*, and* Mulloway (*Argyrosomus japonicus*) Figure 3.

Figure 2: White croaker (*Genyonemus lineatus*)

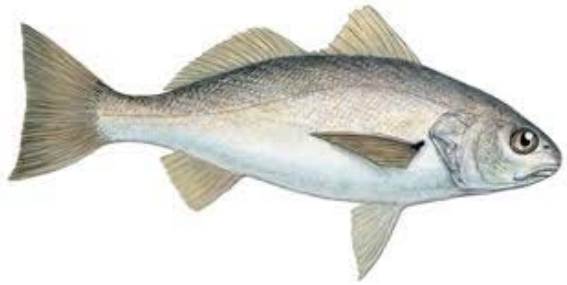
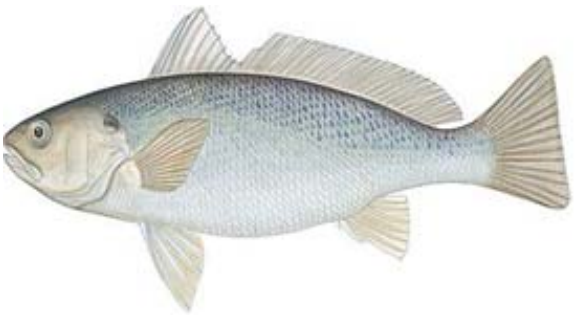


Figure 3: Mulloway (*Argyrosomus japonicas*)



Further on this Japanese croaker, an article published by Jinn-Pyag *et al* in Zoological studies in 2007(6) has indicated an interesting point that there is sexual difference in the spawning sound of the Japanese croaker, *Argyrosomus japonicus* (Sciaenidae). Members of Sciaenidae comprise about 270 species within 70 genera. Their hums composed of bursts of knocking, drumming, or croaking sounds emitted by vibrating pair of striated swim bladder muscles. This article elaborates that Sciaenoid sound production is primarily limited to the spawning season, suggesting it may play a role in reproduction. These fishes begin to call when they reach an age of 6 months. They produce a few sounds during the day time when there is less locomotion. In contrast they become more active during dusk. This leads to increasing inter individual encounters. It is suggested that it could be the cause for obvious increase in sound

production. Adult fish more than five year old emits call during the spawning period. The most vigorous period for their soniferous activity is noted during dusk. This sound was heard without hydrophone even about 3 meters away from the pond.

This discovery is interestingly similar to our Batticaloa singers. The song has been heard by many publics from the Lady Manning Bridge.

Finally, have we identified the singer?

Our famous song consists of many different notes. This intern leads to another question, who else belong to this chamber orchestra? Why this song is amplified only in certain spots in the lagoon? I think further studies should be carried out to confirm or identify the singer/ singers. This is over to the enthusiastic researchers who are keen to find out the composers of the Batticaloa song.

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