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PRESIDENT'S MESSAGE

Yet another release of Batticaloa Medical Journal despite of all the difficulties during the COVID-19 pandemic.The global impact of the COVID-19 virus has been much larger than could have been foreseen at the time of the initial cases in Wuhan in late 2019. Not all the impacts of COVID-19 are negative. Indeed, the research world has moved faster than many would have suspected possible. it took around seven and a half years to go from a few hundred papers a year of output to more than 11,000. In the case of COVID, the same volume has been reached in just four and a half months. Globally We are seeing many scholarly publishers making articles available instantly via Open Access in order to ensure all researchers have access to published material. As of the 1st of June, there have been upwards of 42,703 scholarly articles that have appeared, 3105 clinical trials, 422 datasets, 272 patents, 757 policy documents, and 156 grants (Porter and Hook, 2020)

While we should encourage researchers to get the research done on the regional interest, the articles should be available in the digital format for all to access freely.I'm also very pleased to state that the board of Study (Medicine) of Post Graduate Institute of Medicine, University of Colombo has recognized the Batticaloa Medical Journal for the publications of research article and case report by their trainees.
I congratulate the editorial team for their continuous effort in keeping the research tradition alive in this region by publishing and motivating research articles.

Reference:

Porter SJ and Hook DW (2020) How COVID-19 is Changing Research Culture. London: Digital Science.

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EDITORIAL

Education: The changes and challenges

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Throughout the ages education has been the driving force behind human progression. When our prehistoric ancestors achieved the ability to teach the next generation the innovations and experience gained during their lifetime, their achievements and their wisdom gained immortality. Each generation obtained knowledge and skills from the previous generations, and therefore did not have to create anew from square one. Rather they were free to develop on this knowledge and build up new and greater discoveries. Thus, making humans the only species among millions on this planet to have become a technologically advanced species. This is beautifully illustrated in the famous words of Sir Isaac Newton, he stated "If I have seen further, it is by standing on the shoulders of Giants".

Transmitting knowledge, information and skills to the next generation is the ultimate purpose of education. Teachers have for a long time been considered as mediums who impart knowledge and skills to the next generation. While students the recipients of this knowledge and skills take up the responsibility of developing this knowledge, building it to a greater level and imparting in their turn to the next generation.

This process of teaching and learning, and the teacher learner relationship has changed over time. Today we are living at one of the greatest turning points in the history of education. The decisions that we take today and methodologies which we devise may have repercussions extending over each millennium.

Since time immemorial the teaching learning process had involved direct teacher learner contact. The teacher was the repository for knowledge and skills and the student through interacting with the teacher and following the teachers "plan" was able to grasp the needed information. With the invention of writing this interaction began to change. A teacher could write his knowledge in a document, which could be read and understood generations later. This was the boon which drove the renaissance. After floundering in centuries of conflict, superstitions and illiteracy. Europe emerged within the span of a few lifetimes into the most technologically advance continent on earth. Creating wonders in fields ranging from the arts to science to mathematics. The people of the renaissance were able to rapidly advance due to fact that they were able to access and develop on the forgotten knowledge of the classical period hidden away in books and documents. The next great advance came with the invention of the printing press. Within the space of a few years, knowledge which was privy only to a few elite individuals in society suddenly became accessible to the masses. Knowledge grew exponentially by the input of many human minds working towards solving problems and making discoveries. Many notable discoveries were made by unrelated people in opposite sides of the globe giving rise to the saying "Great minds think alike".

Today we are living during a historical water shed period. Never before in human history has knowledge been so easily accessible to every individual on the planet. Our generation has been privileged to live through this transition. When we were children and students, our source of knowledge was our teachers and limited books provided through the education system and libraries. This is a far cry from the reality of today. Now students have the opportunity to search up any knowledge from any part of the world by means of the world wide web. This platform has virtually eliminated the need for a "teacher" in the traditional sense. The teacher is no more the receptacle of knowledge, in fact a student can in a matter of minutes mass knowledge that would have taken a teacher a life time to learn.

So, what does this mean for the future? Education and the teaching learning process is undergoing a paradigm shift. A change never before encountered by humanity. We must to adapt to this change, and draw new paths to guide the next generation towards fruitful learning.

Learning in the past paid a lot of importance towards memory and retaining facts. Because it was the reality of the time, that when required the user will need to remember facts in order to apply them towards problem solving. Now that reality has been shattered by the internet. With the ever-increasing ease to access knowledge rapidly, the ability to memorize factual data is no longer an essential need. One can argue that, human memory is unreliable and easily affected by many factors. It may be safer to trust the memory of an electronic device

than one's own. In fact, most sophisticated systems today rely on artificial memory, due to its safety and reliability.

The world wide web is an almost limitless source of information. However, this vast source of information creates its own problems for the learner. Learners in past generations had access only to relatively reliable information obtained through learned teachers and scholarly books and documents. Unfortunately, today the internet has given the opportunity for anyone and everyone to become "teachers". Individuals without an iota of knowledge or experience in a particular field, can post essays and opinions on virtually any matter under the sun. The students of today are faced with the unenviable task of shifting through this mixed box of true and false facts in their search for knowledge. Without the skills to identify reliable information from false information, learners are at the risk of losing their path.

The role of a teacher has changed, no more can a teacher be expected or accepted as a receptacle of knowledge. Rather the teacher should act as a facilitator, a friend, and a role model. A facilitator guiding the students towards gaining skills on how to obtain reliable knowledge, a role model for students to emulate with regards to soft skills and attitudes and a friend for students to approach and confide in.

The global education system has as a whole understood the need for change, and many innovative teaching learning methodologies are being adopted from primary schools up to universities.

However, another important conceptual shift is required with regards to examinations or assessments. So far, the system of examinations has not changed adequately to suite the new reality. Many exams still follow traditional methods, dictated centuries ago.

Assessments are primarily used to identify what a student has learnt during the course of his or her learning. It is the way students are identified as capable of taking up roles in society. Choosing the right people for the right job is essential for a society to grow and function. Also, assessments function as road maps for students to focus their learning. The concept being that if a student learns and passes an examination, he or she has acquired the essential knowledge and skills required for the specified level of competency.

Traditionally assessments are conducted broadly to assess how much the student has retained from their learning process and how are they able to apply that knowledge and skill towards problem solving. However, this traditional method, fails in many ways to take into account the reality of todays interconnected world of information. Students should be assessed not on their ability to retain knowledge, but rather on their ability to rapidly obtain reliable knowledge, and on their ability to use this knowledge to solve problems in innovative ways by understanding the underlying principles.

Barring a catastrophic dooms day event, future generations unlike past generations will not need to rely on memory to perform tasks and solve problems. It is unfortunate that most current exams do not reflect this reality, and society is losing many intellectual minds due to archaic examination methodologies.

It is encouraging to note that certain innovative institutes are promoting open book exams where students have access to books and the internet during an exam. This is a promising method of assessing students in keeping with the current reality. Allowing students to use technology which will anyway be accessible for them at all times will decrease the time and effort students spend in memorizing rote facts and instead allow them to channel their mental skills into problem solving.

A limitation of this method some may say is that it may allow incompetent students to pass exams by achieving required grades. One should remember that the current grading system is created in a suitable manner to compensate for human lapses in memory retention and errors in judgment brought on by this gap. It is however incompatible with the degree of competence demanded on professionals in the modern world. For example, the average accepted overall pass grade for the medical curriculum nationally and internationally is around 50%. But how will society feel if a doctor can make a diagnosis and treat only 50% of the patients encountered?

A real-world situation can be recreated in the examination hall by allowing students access to information, yet demanding a higher degree of competence in using this information thus reflecting the reality of today's modern world.

Education systems have a long way to go in order to keep pace with the rapidly changing landscape of knowledge and information. We are truly living in exciting times; the very foundations and concepts of education are changing. Are we ready to embrace the changes and challenges?

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SHORT REVIEW

Cardiovascular manifestations of COVID 19 infection

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Introduction

Throughout history humans have battled many infectious pathogens. This interaction has shaped our evolutionary pathway and continues to play a major role in our development[1]. As humans spread throughout the world and colonized different continents, human disease also became established all over the world. Increasing interaction between communities accelerated through improvements in transport and technology, combined with ever increasing population densities enabled infectious diseases to spread with ease[2]. During the last few centuries, the world faced many Pandemics[3]. Today we are in the midst of the COVID 19 (C19) Pandemic. This disease is thought to have originated in Wuhan, China with the first cases identified in December 2019[4].

Through a combination of easy infectivity, large numbers of carriers and mild infections, associated with unprecedented global contact, within a year it had spread to every continent in the globe and found a foothold in urban as well as rural communities.

The aetiological agent implicated in C19 infections is the SARS-CoV2 virus. This belongs to the large family of corona viruses. It is a single stranded RNA virus which can infect both humans and animals and is similar in many regards to the previously identified SARS-CoV and MERS-CoV viruses[5].

Patients infected with the C19 virus exhibit a range of clinical manifestations ranging from mild asymptomatic cases to severe disease resulting in multi-organ failure and death.

Although SARS-CoV2 virus primarily affects the respiratory system, it has also been found to significantly affect the cardiovascular system increasing the mortality and morbidity associated with C19 infections[6].

The association between C19 infection and cardiovascular disease is complex and manifests in patients with pre-existing cardiovascular diseases and risk factors as well as in previously well individuals. Patients with pre-existing cardiac conditions and patients with coronary artery risk factors such as diabetes mellitus and hypertension are at higher risk for severe respiratory disease6. Also patients developing severe respiratory illness have a higher incidence of cardiac dysfunction. At the same time cardiac disease had been noted for the first time in previously well patients afflicted with the virus. Therefore cardiac manifestations of the disease may also complicate and confound the clinical picture[6].

The purpose of this article is to describe the cardiac manifestations of C19 disease and provide an overview of the possible mechanisms involved in the pathogenesis of these manifestations.

Cardiac manifestations seen in C19 include:

- Myocarditis like presentation
- Acute coronary syndrome
- Right ventricular dysfunction associated with pulmonary hypertension
- Arrhythmias
- Multisystem inflammatory syndromes in children and adults (MIS-C/ MIS- A)

The underlying mechanisms leading to these cardiac manifestations are not fully understood, however most probably there are a combination of factors and mechanisms involved in producing these cardiac complications.

Pathogenesis of Covid 19 infection

The pathogenesis of the C19 infection is not well understood. However, an ever increasing body of evidence suggests that disease manifestations are a combined of result of direct cellular damage by the viral particle and a dysregulated immune process[7].

The SARS CoV 2 virus gains entry into the body by attaching itself to ACE2 receptors by way of its spike protein. The spike protein also known as the S protein is a glycolated protein found in large numbers over the surface of the SARS CoV 2 virus[7].

This protein has the ability to bind onto ACE2 receptors which are expressed on cell surfaces, thereby enabling entry of the virus into the cell[8].

Upon entry into the cell, the viral RNA is released into the cell facilitating, the viral RNA to replicate synthesize structural proteins and create new viral particles. These new particles are subsequently released from the cell resulting in death of the individual cell[7].

This process causes direct cellular damage to the host cells ensuring organ dysfunction. Also this process releases a large number of pathogen associated molecular pattern (PAMP) and damage associated molecular pattern (DAMP) molecules. These molecules stimulate the innate immune system, induce inflammatory cell infiltration and release excessive quantities of cytokines, chemokines and free radicals causing ARDS and MODS[7].

In addition to the lungs, kidneys and the GI tract, ACE2 receptors are found in particularly large numbers in the heart and vascular endothelium[8]. This abundance of ACE2 may explain why the cardiovascular system is particularly affected in C19 infections.

It is interesting to note that most patients manifesting with cardiac disease are those already predisposed to adverse cardiac events due to multiple risk factors such as diabetes mellitus, hypertension, past history of ischemic heart disease, heart failure etc. Studies have shown that patients with heart failure are known to express an excess of ACE2 receptors making the heart a prime target for the SARS Cov2 virus[9].

Myocardial cell injury and positive troponin

Many patients with C19 have been found to have raised troponin levels. A raised troponin indicates poorer outcomes 6. Troponin is an intracellular protein found within myocardial cells. Raised levels indicate some myocardial injury resulting in measurable troponin proteins in the serum. Myocardial cell injury may be due to either myocarditis or due to cellular ischemia.

Cellular ischemia may be either due to occlusion of the epicardial vessels or cardiac microvasculature with consequential tissue hypoperfusion or due to systemic causes resulting in generalized hypoxia

Endothelial dysfunction could be a precipitant resulting in myocardial ischemia. The endothelial cells are also known to express large numbers of ACE2 receptors. Making it a prime target for viral invasion. The heart is supplied by an extensive microvasculature. It is possible that endothelial dysfunction developing as a result of endothelial cell damage may play a role in promoting tissue hypoxia through, the development of vascular inflammation, microthrombi formation, increased vascular permeability and an imbalance between vasospastic and vasodilative factors.

Acute coronary syndromes

Acute coronary syndromes have been noted to be associated with C19[6]. The exact mechanism for this association is not well understood. It is possible that C19 infection triggered the rupture of clinically silent plaques as a result of either direct endothelial damage or the systemic inflammatory process.

Endothelial dysfunction may play a key role in type 1 myocardial infarctions. As the viral particle attaches and enters the epithelial cells it results in a hyperinflammatory state of the endothelium. In patients with pre-existing plaque disease, inflammation of the overlying endothelium may promote plaque erosion and rupture. Thereby initiating a type 1 myocardial infarction

Thrombosis is further promoted due to the hyperinflammatory state resulting in prothrombotic conditions[10]

Myocarditis

Many viral infections are known to cause myocarditis. It may occur due to either direct damage to the myocytes by the invading viral particles or it may result due to inflammation caused by the heightened immune response and cytoplasmic storm.

Right ventricular dysfunction (RV)

RV dysfunction has been well described in C19 infection. Several case series and studies have shown characteristic features of RV dysfunction[11]. Features commonly described include right ventricular dilatation and hypokinesis.

The RV is a thin walled structure which is anatomically and functionally well adapted to handle large volumes of blood while working at relatively low pressures[12]. In C19 severe lung involvement or associated pulmonary embolisms result in acute pulmonary hypertension which has a detrimental effect on the RV.

Arrhythmias

Abnormal cardiac rhythms have been observed in patients. Both atrial and ventricular rhythms are seen ranging from sinus tachycardia to lethal rhythms such as ventricular tachycardia. Most commonly encountered pathological rhythms include atrial fibrillation, atrial flutter, and

ventricular tachycardia. Polymorphic VT has been described associated with QT prolongation[13]

Arrhythmias may be due to a combination of ischemia, direct myocardial irritation to myocytes and the conduction system, electrolyte abnormalities, hypoxia, heightened immune response and treatment with QT prolonging medications

MIS-C and MIS A

Multisystem inflammatory syndrome in Children (MIS-C) and Multisystem inflammatory syndrome in adults (MIS-A) are novel conditions associated with recent C19 infection[14]. Cardiac manifestations of this condition can lead to severe illness and death if not recognized and treated early[15]. Although the presentation of MIS-C is similar in many regards to Kawasaki disease, several features may help to favour one condition over the other. MIS-C tends to affect an older age group of children and more commonly presents with hypotension and prominent gastrointestinal symptoms. Hematological investigations show lymphopenia with thrombocytopenia and echocardiogram shows features of left ventricular dysfunction, valvular regurgitation and pericardial effusions; coronary dilatation which is a frequent finding in Kawasaki disease is minimal or absent in MIS-C[16].

Conclusion

It is currently well known that C19 infection is associated with variable cardiac manifestations. Patients with pre-existing cardiac diseases and cardiac related risk factors are at a higher risk of developing severe disease. It is important to create awareness among health workers to actively monitor patients for the onset of cardiac complications. Remote care and remote monitoring may not be effective in identifying cardiac complications early. Patients with pre-existing cardiac conditions should take added precautions to prevent C19 infections, by means of adhering to proper health guidelines and obtaining recommended vaccinations.

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REVIEW ARTICAL

Cutaneous Larva Migrans in Children

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Abstract:

Cutaneous larva migrans (CLM) is a skin infection caused by parasitic larvae, mostly animal nematodes include Ancylostoma braziliense and Ancylostoma caninum. It frequently prevails in tropical and subtropical countries. The larvae enter the sites which generally contact the infected soil include hands, feet anogenital, and buttock. Clinical manifestation varies from uncommon nonspecific lesions to common typical linear erythematous itchy lesions. Diagnosis is mainly by its typical appearance. Laboratory investigation has a limited role in the diagnosis of CLM. Although there are few systemic treatments available including albendazole, Ivermectin thiabendazole to achieve a clinical cure, the drug of the first choice would be albendazole. Topical treatment with thiabendazole is effective, but it needs to be applied for a long period. Prognosis is generally excellent.

Keywords:

Cutaneous larva migrans, albendazole, Ivermectin, buttock, nematodes

Introduction

CLM is a cutaneous infestation caused by the invasion and migration of parasitic larvae [1]. These larvae are mainly from nematodes but rarely caused by other insects [2]. It prevails mostly in tropical and subtropical countries and also causes travel- associated skin disease in these countries [3, 4]. This infestation was first defined and published by Lee, an English Physician in 1874, and Crocker named it CLM in 1893, followed by Hammelstjerna confirmed that it is due to parasitic etiology in 1896 [5,6]. Later White and Dove described subcutaneous migration of Ancylostoma larva in1929 [7]. Thereafter, there were many cases published in the literature and a variety of organisms has been identified as aetiologies. This condition is also recognized as creeping eruption, sandworms, plumbers itch, duck hunter itch, creeping verminous dermatitis, and epidermatitis linearis [1].

Epidemiology

CLM distributed all over the world, but prevalence is more common in tropical and sub-tropical countries especially occur during warmer and rainy seasons [1, 3, 4]. There are countries that are endemic to CLM, including South East Asia, South America, Africa, Caribbean islands, South East United States [8]. This disease has been endemic in countries where poor sanitation and warmer environments favor the development of larvae. The factors influencing the occurrence of CLM include environmental conditions such as temperature between 23to300C, loose humus soil, shady areas, proper aeration, and human conditions like the amount of soil contamination and extent of contact with the soil [9, 10].

Aetiology &Pathogenesis

CLM is caused by a variety of parasitic larvae, mainly from nematodes which have the inherent ability to penetrate the skin and the embryonated eggs of the parasites are shed into the soil. The eggs hatch and release rhabditiform larvae in the soil under the appropriate environment within 1-2 days [1, 11]. Within a week, the rhabditiform larvae moult, grow and develop into infective filariform larvae which may remain infective in the top one-half inch of the soil projecting outward from the surface and search for prey under suitable conditions. The size of this filariform has been 850 microns in length and 35 microns in diameter. Though generally, 90% of filariform infective larvae die within 3 weeks, the rest remains in the soil for several months unless floods and drying disturb them [10]. The larva enters into the human skin in response to contact (thigmotropism), carbon dioxide, or warmth and uses gaps in the epidermis of the

host like fissure and hair follicle, but the juvenile larvae enter the epidermis at any sites [10,12].

The larvae enter the sites which generally contact with the soil include hands, feet, and buttock and remain in the epidermis for 3-4days [12, 13]. It starts to move with the help of an enzyme, hyaluronidase produced by the larvae, and within a few days, it forms itchy lesions containing vesicles, papules, and desquamation along the tract of migration. As the human an accidental host the larvae die without completing the life cycle within a few weeks of the invasion, ultimately the disease ends with the decaying of larvae [14, 15]. Hookworms and Strongyloides have been similar morphology, but Gnathostoma lesions are identified by cuticular spines [1].

Clinical Manifestations

CLM has varied clinical manifestations which include the most common, typical lesions to less common, non-specific, ill-defined lesions. Once the larva penetrates, either it may be silent for several weeks without causing clinical features or starts to creep immediately to cause a lesion. It forms an erythematous, papular itchy lesion at the site of entry and it looks like a little elevated pink coloured lesion with the size of 2-3mm. later it further extends and creates linear, serpentine, or bizarre tracts. When multiple larvae enter at the same time, it might form disorganized loops and several tortuous tracts [16]. Rarely, there may be hundreds of tracts in severe infection [12]. The larvae creep at the rate of 2-5cm and visible tract move forward by 1-2cm. Further, there might be several vesicles along the lesion associated with folliculitis due to itching.

The lesions are usually seen in the sites which usually contact the soils include feet, buttock, anogenital region, and upper extremities. The eruptions are commonly itchy and sometimes severe enough to cause insomnia. The burning sensation may a rare presentation too and also present with bacterial infection secondary to scratching [11, 16, 17]. CLM is categorized depending on the organisms and their lesions in table-1 [17].

CLM can rarely cause systemic symptoms like Loeffler's syndrome due to migrating larva to lungs and they present with chronic cough and difficulty in breathing [17]. Migrating larvae in the cornea may produce inflammation and corneal opacity [18]. Sometimes invasions into the muscle cause myositis [19].

Table-1: Various parasitic larva, definite host, route of entry, rate of movement and type of lesions [10, 14 16, 17, 20-22]

	Host	Pathogen	Route of entry	Rate of movement	Lesion type
1	Animal hook worms	Ancylostoma duodenale and Ancylostoma caninum	Skin	3.5 to 5 cm/ day.	Large tracts, may be protracted, long-lasting for months
2	Human hook worms	Ancylostoma duodenale and Necator americanus	Skin		Short tracts/ground itch
3	Human strongyloides	Strongyloides, stercoralis	Skin		Prominent blister formation, and extreme itching, wander to the lungs and intestine
4	Animals strongyloides	Strongyloides myopotomi and Strongyloides procyonis	Skin	up to 5 cm/ hour	
5	Animals	Gnathostoma	Skin		(Larva currens), track is wide, poorly defined and long
6	Insect larvae	Some species of gastrophilus and hypoderma	Ingestion of larvae	Up to 4.5 cm/ day	Lesions is variable. Some are like human species and other like erythema multiform. Distinctive burrows are seen on light examination directly
			Skin	3 to7.5 cm/ day	
					wide tract that vanish and reemerge at a distant location. visualized by naked eye
					(Myiasis linearis) A single continuous tract without blister formation

Pathology

The histopathological appearance of the lesion usually reveals no larvae in the tunnel as the lesion grows up after a time period of larvae pass through, instead, the tunnel is infiltrated with polymorphonuclear cells, eosinophils, and necrotic keratinocytes in the epidermis [23]. The larvae might be located in either burrow or hair follicle without inflammation [17]. All hookworm migrates in the epidermis while Strongyloides creep in the dermis. Other parasitic larvae which included Gnathostoma, Gastrophilus, and Hypoderma move along both epidermis and dermis [17]. It is hard to differentiate the various hookworm in the histopathological segment, but Gnathostoma, Gastrophilus, and Hypoderma are relatively bigger and distinctive morphological appearance [17].

Diagnosis

The diagnosis of CLM is usually clinical due to its typical lesion, rarely it is missed following either itching and secondary bacterial infection or atypical nature of the lesion [1, 16]. Laboratory investigation has a limited role in the diagnosis of CLM [24]. Blood report may reveal either elevated immunoglobulin E (IgE) or eosinophilia or both. Stool examination rarely reveals Strongyloides larvae, so it is not worth. The biopsy of the lesion is not recommended in the diagnosis of CLM due to invasive procedure and also it does not reveal larvae [1]. Epiluminecent microscopy has been identified as a non-invasive mode of diagnosis at present [25], but some centers suggest a method that detects specific IgG with enzyme-linked immunosorbent (ELISA) [26].

Differential Diagnosis

CLM shares the differential diagnosis which includes other common pathologies such as allergic contact dermatitis, urticarial factitis, and other types of dermatitis, pyodermas, subcutaneous nodules, granulomas due to other species and different pictures of myiasis [26]. The other conditions that look like CLM include scabies, urticarial, photodermatitis, erythema chronicum migrans, and stings of Portuguese man-of-war or jellyfish [8].

Treatment

Treatment should be given to reduce intense itching, unpleasant sensation, length of the disease, and the complication due to CLM. All the treatments are impractical and also not equally effective [24, 26]. Some of the lesions recover spontaneously on their own within 1 to 6 months or rarely longer while others need treatment. Several treatment options are available

1. Surgery

It is possible only in the case of creeping of Gnathostoma sphinigerum. Otherwise could not find larvae that are well ahead of the tract [24].

2. Cryotherapy

It can be used to kill migrating larvae, but it is a painful and indefinite way of killing as moving larvae is far away from the visible tract and also larvae tolerate the temperature as low as 210C for 5 minutes and this in turn of failure of treatment [8, 27].

3. Topical Treatment

Fifteen percent (15%) thiabendazole, 2% gamrriexane cream, 25% piperazine citrate, metriphonate are the available topical agents [13-16]. Thiabendazole has been proven to be effective among all tropical agents, but it needs a repeated application and might cause irritant effects and also possibility of recurrences is often reported [8, 26, 29].

4. Systemic therapy

Thiabendazole

It is effective with the oral dose of 25-50mg/ kg, once daily for 2-5days. It has not been chosen in most of the country due to its sides effects like nausea, anorexia, headache, and other gastrointestinal disturbances and also unavailability in most countries [8, 26].

Albendazole

It is the first drug of choice in most countries since 1982 due to its effectiveness and it is well tolerated by the patients in the short term use. The dose would be 400-800mg/day for 1-7 days [24, 30]. It relieves pruritus within 3-5 days and resolution of the lesion within 5-7days after treatment [26]. It rarely causes high liver enzymes, alopecia, allergic reactions, leucopenia, and thrombocytopenia with the prolonged administration [26,30]. Although the mechanism of action is not known, this drug is effective against eggs, larvae, and adult stage of numerous helminths. It is known to act by blocking the glucose uptake, thus, in turn, decreased production of (ATP) adenosine triphosphate and also induce degeneration of cytoplasmic microtubules with the death of the parasites by autolysis. Some consider that it acts by inhibiting microtubules polymerization [24].

Ivemectrin

It is another effective drug against CLM. It is useful in a single dose of 150-200mg/kg and eradicates parasites with the minimum side effects, but the drug is still under trial [24, 26].

Flubendazole

It is another anthelmintic drug under the experimental stage and might offer a valuable vision to the field of helminths. The recommended dose would be 200mg/day for 5 days [26].

Prevention

Though total eradication of larvae causing CLM is impossible the deworming of the domestic dogs and cats might reduce the soil contamination and incidence of CLM. The personal preventive measures to minimize soil contamination include wearing footwear while walking, wearing shoes, and using a beach towel when lying on the sand. Sandboxes for playing children should be protected from dogs and cats [1].

Conclusion

CLM is a cutaneous dermatitis caused by parasitic larvae especially animal nematodes. The clinical conditions are easily diagnosed by its typical appearance and travel history to an endemic area. The condition is amenable to treatment with either albendazole or ivermectin. The control of CLM can be archived by deworming domestic animals and personal protective methods.

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Brief original article

Combined feedback experiences amongst health-care students

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Introduction:

Feedback processes help identify the gap between the intended results and the actual results, and this provides the opportunity for change (Ende, 1983). While feedback in its general sense is information that a system uses to make adjustments in reaching a goal, only if this information gained from the performance is used to change future performance does it lead to learning (Ende, 1983). So, Feedback is an essential aspect in teaching-learning activity in education. In health- care education studies, it forms a vital part of professional development of a teacher (Nofziger et al., 2010). Several studies have reckoned the significance of good feedback and suggested certain techniques for effective feedback (Van de Ridder et al., 2008). It seems that there is a few data in the field of health-care education to substantiate the effectiveness of these techniques. There was no study is available in literature that has explored a combined environment phenomenon and as such this will be the first study to research this subject since most studies have explored individual written and oral feedback and its sequela. To develop and reflect the proposed methodology as outlined below, precise emphasis placed on the current understanding of the topic in literature. This fosters the theoretical understanding of the processes and understood in greater depth from the themes that emerge from the study (Bates & Jenkiins, 2007).

To conduct an effective literature review, I used different databases such as Pubmed, ISI web of science, Medline and Eric using the following words; 'feedback', 'group feedback', 'combined feedback', 'medical education feedback', 'university feedback', 'team feedback', 'individual feedback', 'students', 'educators' and other related phrases using the themes that will be generated in phase 2 of this study.

A brief literature review was done as follows: London & Sessa (2006) in their review have hypothesized that group feedback has a potential to increase learning. Social learning theory does suggest that observing performance appraisals in a group setting may lead to an observer's perception of positive consequences in behaviour, being utilised by those receiving positive feedback, to be positively reinforced (Barr & Conlon, 1994). Gabelica et al (2012), in their review article highlighted that group feedback was a powerful tool that raised the level of individual performances within when compared to individual feedback.

Combined feedback was observed by grouping two students together who would listen to each other's feedback being offered by the tutor on various aspects of their submitted work. During the session an opportunity was given to learn from someone else's queries and mistakes which resulted in a wider and better feedback experience. But since this is not a common occurrence and often the concept of feedback is promulgated as a singular interaction with a student (Cantillon & Sargeant, 2008), this phenomenon became interested with the following questions:

1. How is combined feedback experience perceived by the tutor?
2. How might feedback be perceived and interpreted by student as a receiver, in the presence of another student B as an observer?
3. How might the Student benefit from observing this feedback processess?

Methodology and Methods:

The scope of this study is to explore the role of combined feedback in health-care education settings. Every research is governed by its ontology which is a branch of metaphysics concerned with the nature of reality from which a theory emerges. Epistemological approach (Bates & Jenkins, 2007) that gives the understanding for the knowledge about the reality that exists and validates the generated theory or refutes it (Grix, 2002). This research is informed by the social constructionist paradigm (Robson, 2011). A paradigm is defined as a 'basic set of beliefs' that originate from the view of its holder (Guba,

& Lincoln, 1994). Once the paradigm is understood, it leads to its logical ontology, which further informs its epistemology, and this helped in generating the research questions. Qualitative methodology was used because of the comparative dearth of the information available on this subject. Limited understanding of the process of combined feedback, study group and their perceptions warrant this method to analyse effectively the emerging themes.

Since this study was conducted in a setting to generate a greater understanding of this subject using reflections, a 'case study' serves as the best approach for answering the research questions number 2 and 3. A 'case' is any individual or situation or an experience (Robson, 2011), which the researcher is interested in studying in a greater depth or detail termed as a 'case study' (Flyvbjerg, 2006). A quantitative approach then seems to be inappropriate because sample size is limited and it is hard to numerically understand the variable themes that will emerge from the study. This was an 'analytic' (Méndez, 2013) auto-ethnography approach which involves writing objectively and analysing a group to understand the feelings and experiences within.

In this approach, it was assimilated into the study from a social perspective rather than as an outsider who focused on objective observation of the phenomenon as a positivist researcher would do. In contrast, here social reality was preserved and maintained as a creation of self-reflections of those who are part of the study rather than objective entities that must be discovered. This allows a more subjective reflection, making it more valid, as experiences are collected by self, with authentic self as a source rather than the risk of contamination posed by an outsider (Wall, 2006). This helped to narrate using a constructionist account, of the learning opportunities afforded by Student A using Student B's feedback.

Samples:

Two health-care teachers selected based on their expertness of the feedback process which is known as purpose sampling (Robson & McCartan, 2011) and two health-care students and researcher also part of this study and decided to use this sample, known as convenience sampling (Robson & McCartan, 2011). This enabled to understand the usage and perceptions of this technique and make recommendations to generalise it across different similar settings if possible.

Data collection:

Phase 1 of this qualitative study intended to answer question one. This involved interviewing the 2 expert feedback providers using a 'symbolic interactionist perspective' (Yates, 2013). In this framework symbols were created using interactions with people to understand identities and social perspectives. Since Research interviews are social interactions, social constructs were created using the personal and social identities in a particular situation of both the interviewer and the interviewee (Yates, 2013). This effects the style, stone and language of the interview, hence constructing new knowledge. This gauges in to the social constructionist paradigm which argues that new knowledge is created using interactions with people (Charmaz, 2006). These interviews were largely be in the form of 'focused' interviews (interviewer has some control as a guide) where important aspects of the combined feedback situation were discussed along with an attempt to understand the expert's prior assumptions before phase 2 where combined sessions were conducted. These interviews were recorded for data analysis.

Phase 2 involved the combined feedback sessions with students. Data collection were by means of written short reflective essays filled by the students and tutors after each feedback interaction. To facilitate data collection and original experiences and thoughts a well-known reflective model of Boud (Boud, 2001), who the students and tutors were already familiar with, were used. Four feedback interactions as part of research module and clinical teaching module during different times within the modules were used for this approach for each individual.

There were a total of 26 reflective accounts. There were 10 written reflections of receiving feedback as student, 10 reflections of the observation process during peer feedback as student and six written faculty reflections.

Data analysis:

Two interviews and 26 reflections formed the basis of 'Data corpus' (Holloway & Todres, 2003) (all the data gathered for a particular study) for this study. These reflections were divided in to two 'data sets' (data from the corpus used for specific analysis) of written reflections from the perspective of Students.

These were typed and analysed for important 'themes' that emerge from them. 'Themes' (Robson, 2011) are groups of data characterized and labelled in to groups to make connections that help identify and interpret patterns within the data and to make sense or make future predictions in a meaningful way (Pole & Morrison, 2003) by answering the research questions asked. These themes were characterized appropriately into well thought out broad categories (Evans, 2002). This general approach was then formed a concrete basis for 'thematic coding analyses' (Robson, 2011). This method is termed as the 'fundamental basic method' (Holloway & Todres, 2003) for qualitative data analysis

Conclusion

This study enabled to validate this new approach being termed as 'combined feedback' to undergo a thorough internal validity assessment by conducting this research. It helped the health-care educators and other relevant fields in general to incorporate this method to offer feedback to students and provide them insight into the usage, benefits,

limitations and advantages of this method for themselves and their students. Since this is a qualitative study with using two different approaches: auto-ethnography and a case study, it provided an in-depth overview of the technique in the setting which also provided researchers to replicate this study in their own setting to make it more generalizable.

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Brief original article

Chronic illness management in COVID 19 era: An experience from primary care center

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Abstract:

The COVID-19 pandemic has questioned the continuous and comprehensive management of chronic illness. This caused a profound impact in the service delivery of primary care centers due to new health guidelines and the availability of limited resources. Therefore a new local guideline is required as a timely need in order to overcome the challenges caused by the pandemic. This article aims to brief the local guideline which was prepared by the University Family Health Center, Kondavil.

Keywords:
COVID-19 pandemic Introduction

Background

The chronic illnesses were defined as "conditions that last 1 year or more and requires ongoing medical attention or limit activities of daily living or both by The centers for disease control and prevention (Centers for Disease Control and Prevention, 2019). The long-lasting characteristics of chronic illness require continuous and comprehensive supervisions, observations and/or care. Thus primary care centers play an important role in the management of chronic illness (Reynolds et al., 2018). The primary care centers deliver their services through Out Patient Department (OPD) system in Srilanka ((Perera, 2017).

University Family Health Center, Kondavil (FHC, Kondavil) is a primary care center which is associated with Department of Community Medicine and Family Medicine, Faculty of Medicine, University of Jaffna. It is located in the premises of Divisional Hospital, Kondavil, Jaffna. The FHC, Kondavil has 200 registered patients under Non-Communicable Disease (NCD) clinic for chronic illness management.

Rationale

The novel human corona virus disease COVID-19 was reported first in the end of 2019 in China and became pandemic in 2020(Chen et al., 2020). In order to prevent and/or control the spread of COVID-19 infection to community, several countries around the world implemented lockdown measures along with new health guidelines with safety measures to limit the spread of COVID-19.It includes avoiding contact with people more than 30 minutes, physical distancing of at least 1m from each others, must wear face mask and frequent hand sanitization (MOH, 2020). As a result, continuous and comprehensive management of chronic illnesses have become very challenging and led to 'Twin Epidemic' condition by developing complications due to sedentary lifestyle and missing clinical follow-ups (Azarpazhooh et al., 2020). Therefore developing an effective chronic disease management plan at the primary care level in accordance with the new health guidelines using the available limited resource setting is necessary

Objective:

To formulate an effective chronic illness management practice at primary care level during COVID-19 pandemic

Methodology:

The participatory action research methodology was used to develop an effective chronic illness management system with the limited resources available in the FHC, Kondavil. It is an approach in public health research, where the researchers and participants work together for the betterment of their living community. It is a qualitative research method which has three major repeating actions – engagement, empowerment and reflection (Pyrch, 2018).

The main investigators of this study are Rubavinoth. K (medical doctor) and Kumaran.S (consultant family physician) along with a team of two groups.Such as primary care center staffs (nursing officer, registered

nutritionist, medical laboratory technician, health care attendant and health care assistant) and patients from Kondavil village.

The sudden onset of lockdown and the new health guidelines for COVID-19 have become a challenge not only for the staffs, but also in identifying opportunities. The virtual focus group discussions were conducted with the staff and patient welfare society members via Viber and WhatsApp conference calls. They were empowered to find out the solutions for the action plan development. The reflection of suggestions made was taken as an engagement to empower both the staffs and patients. The cork-screw cycles of engagement, empowerment and reflection were continued until developing an effective chronic illness management practice at primary care level in COVID-19 era.

Results and discussion:

Brief discussion about the development of an effective plan for chronic illness management at primary care level during COVID-19 era

The clinic was conducted as through Out Patient Department (OPD) until March 2020 – before lockdown. In order to prevent the community spread of COVID-19, medications were delivered without doing vital examination in the clinic. Home delivery of the medications was arranged to isolated areas. The effectiveness of this method has been shown to be poor in the management of chronic illness.

This is the 1st challenge which urged to initiate an effective chronic illness management plan. Firstly OPD system was converted to an 'Appointment' based system. Therefore, all 200 patients were divided into 4 major groups and each major group was divided into 4 minor groups to cover the clinic hours from 8.00 am to 12.00pm. One hour was allocated to each minor group with 10-15 patients. Patients were empowered by providing clear explanations about the system and allocated timing also placed on their clinical record book in sticker form (Figure 1). Telemedicine service was enabled in order to provide consultation services over the phone calls. This new appointment based system aided to avoid unplanned visits along with patient satisfaction and also minimized congestion.

The 2nd challenge was how to provide a first line protection for to both patients and staffs from the suspected COVID-19 patients visiting to the center. Hand washing station was arranged by the patient welfare society at the entrance of the center in order to facilitate the hand hygienic practices. A triage system was implemented at the entrance of the building. Health attender was trained to carry out the triage and patient's involvement also encouraged. The checklist of triage was prepared including temperature, symptoms and contacts with positive cases and suspected cases. The reflection of the pilot plan was discussed with staffs and patient welfare society members of FHC; Kondavil.A permanent triage system was executed in the entrance of the center with the involvement of Patients. This helped to prevent from community spread and allowed to continue routine operations of the FHC,Kondavil.

The 3rd challenge was how to reduce the 'person to person' exposure time duration to avoid unwanted exposure of both staffs and patients. This challenge empowered the staffs to implement a plan to act quickly without exceeding 30minutes contact time with physical distancing of at least 1m.Therefore the regular working station was separated for each tasks and time allocation was limited to maximum 10 minutes per station.

The medications were pre-packed prior to clinic visit with corresponding patient's name, registration number and appointment time (Figure :).This eased and medicine delivery and reduced the unnecessary contact exposure of people in center. It allowed running routine monthly follow-ups and drug delivery without fail.

Table 1: Separated work stations and duties

Stations	Station 1	Station 2	Station 3	Station 4 (if necessary)	Station 5
Actions	Entering the appointment and scheduling for next appointment	Taking anthropometric measurements and blood pressure checking	Doctor consultation	Referrals for patient education about self-care and management at home level	Drug distribution
Maximum time allocation	5 minutes	5 minutes	10 minutes	10 minutes	5 minutes
Precautions	Using hand sanitizer after each exposure Wearing face mask, face shield and gloves (if necessary)				

The 4th challenge was preventing the onset of chronic illness complication due to sedentary lifestyle. Patients were educated and facilitated to do self-care and management at home level. Patients were encouraged to do organic home gardening as their leisure time activity by distributing free seeds to everyone. Training and inspection were conducted by the agriculture inspector of the area. Further patients were encouraged towards the fruitful outcomes of organic farming, such as physical activity and boosting immune system by consuming fresh fruits and vegetables; in order to manage the chronic illness conditions as well as COVID-19 infection spread.

The 5th challenge was inadequacy of resources. The new health guidelines had been challenging in terms of human resource, time, space and finance as it was difficult to follow it. The available and limited human resources such as staff of FHC, Kondavil, staff from Department of community and family medicine, Faculty of medicine, University of Jaffna and the staff of Divisional Hospital, Kondavil are worked together with defined roles to manage the inadequacy of human resources. Monthly meeting was conducted to co-ordinate the human resources and manage the conflicts in work place. Patients waiting time for consultation was effectively managed by providing group education about self-care management. The limited space available was utilized to allocate time or day to each workstation. (Antenatal clinic- Tuesday, Vaccination- Wednesday and Chronic illness management- Thursday, Friday and Saturday). Inadequacy of financial shortage was overcome with the support of patient's welfare society, especially for new set-ups like hand washing and triage system. This challenge facilitated FHC, Kondavil to prepare the local user-friendly guidelines for staff.

Table 2: Main contents of the action plan

Challenge	Discussed solution	Reflection after implementation
Congestion	• Appointment based system and telemedicine	Reduced congestion
First line prevention from infection and spread	• Hand washing station set-up at the entrance • Triage system	• Hand washing station set-up at the entrance • Triage system
'Person to person' exposure duration	• Separated working stations and limited time duration	• Reduced the contact time of each patient with staff
Chronic illness complications development due to sedentary life style	• Patient education • Free seeds distribution for organic farming at home	• Facilitated self-care and management at home level • Enhanced the physical activity and boosting immune system by consuming fresh fruits and vegetables from home gardening.
Inadequacy of resources	• Human resources- Defined roles, monthly meetings and worked together • Time- patient's waiting time utilized for education • Space- Rostered working days and working stations • Finance- Support from patient's welfare society	• Facilitated to develop a new local guidelines for staff

Conclusion and recommendation:

This study shows the interruption caused in delivering chronic illness management services during COVID-19 pandemic can be overcome in primary care settings by following appointment based system (avoid congestion), triage (minimize the entry of infected cases), separated working stations (reduce the risk in the work place), self-care management at home level (prevent the chronic illness complication development) and proper resource management (overcome the inadequacy).Establishments of above mentioned recommendations can facilitate the continuity of chronic illness management in COVID-19 era.

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Brief original article

Outcome of artery-sparing modified Palomo operation for primary varicocele in a cohort of soldiers

C.S. Chaegar[1], A.P.I. Prabath[1], S.A.S. Goonewardena[1]
[1]National Hospital of Sri Lanka, Colombo

Abstract:

Varicocele is characterized by abnormal tortuosity and dilatation of the veins of the pampiniform plexus within the spermatic cord. The prevalence of varicocele is approximately 15 % in unmarried military recruits. We report a consecutive series of soldiers from the Sri Lanka Army undergoing an artery-sparing modified Palomo operation, with emphasis on outcome measures such as clinical disappearance of varicocele and improvement in seminal parameters.

Keywords:
Varicocele

Introduction

Varicocele is characterized by abnormal tortuosity and dilatation of the veins of the pampiniform plexus within the spermatic cord. The prevalence of varicocele is approximately 15 % in unmarried military recruits. Varicoceles are progressive lesions that may hinder testicular growth and function (spermatogenesis and steroidogenesis) over time.Alejandro Palomo of Guatemala described the original Palomo operation for primary varicocele in 1949 (1). We report a consecutive series of soldiers from the Sri Lanka Army undergoing an artery-sparing modified Palomo operation, with emphasis on outcome measures such as clinical disappearance of varicocele and improvement in seminal parameters.

Patients and methods

This retrospective study was conducted at Urology Unit I of the National Hospital of Sri Lanka from 1 August 2009 to 31 December 2011. Forty three (43) consecutive soldiers who underwent the modified Palomo operation (high retroperitoneal ligation) were analyzed. However, due to non-availability of follow-up data 15 soldiers were excluded from the study, leaving only 28 patients for the final analysis. All patients had their basic demographic details, clinical presentation, side and grade of varicocele (selected for operation) and pre-operative semen analysis documented. The lower reference limits for sperm concentration was taken as 15 million per mL (12-16) and for progressive motility 32% (31-34%), based on the World Health Organization laboratory manual 5th edition, 2009. Since all men in this study had morphologically normal forms above the minimum of 4%, in both pre- and post-operative semen analyses, this parameter was not considered in the final analysis.

The patients were examined in supine and standing position and the grade of varicocele defined according to Dubin & Amelar (2). Grade I- palpable with the aid of Valsalva manoeuvre; Grade II- palpable on standing without Valsalva manoeuvre; Grade III- visible and palpable on standing.

Briefly, modified Palomo operation was performed with a short transverse (5-6 cm) muscle-splitting incision 2.5 cm medial and above the anterior superior iliac spine. The internal spermatic vein(s), usually 1 or 2, were ligated retroperitoneally after excising a segment at least 2.5 cm in length. Testicular artery and vas deferens were never encountered in this procedure.

Initial follow-up was at 3-4 months with post-operative semen analysis (90 days after surgery), an inquiry on absence or persistence of symptoms, and clinical examination to find disappearance or persistence of the varicocele, development of hydrocele or testicular atrophy as complications.

Success of the operation was defined as the disappearance of a palpable varicocele at 3-4 months after surgery, and an improvement or no change in semen parameters. Failure of the operation was defined as the persistence of the varicocele at 3-4 months after surgery, and / or worsening of semen parameters such as sperm concentration or progressive motility.

Results

The age of patients ranged from 18 to 45, with a mean age of __+/-__years (Table 1). The site of varicocele operated was left-sided in 27 (96.4%) and right-sided in one (3.6%) patients. Fifteen (53.5%) patients had a visible grade III varicocele and 11 (39.3%) grade II varicocele with data lacking in 2 patients.

Table 1. Age of patient in 28 cases

Age (years)	No.	%
16-20	7	25.0
21-25	9	32.1
26-30	7	25.0
31-35	1	3.6
36-40	1	3.6
>41	3	10.7

Most of the patients i.e. 21 (75%) presented with ipsilateral scrotal or lower quadrant abdominal pain. Five (17.8%) patients had noticed a left-sided scrotal swelling without pain and only 2 (7.2%) were referred for evaluation of subfertility.

No hydrocele formation and testicular atrophy were found at 3-4 month follow-up.

The vast majority i.e. 21 (75%) had disappearance of the varicocele. In 5 (17.8%) patients data were missing. Two (7.2%) men had persistence of the varicocele and both men were subsequently subjected to transfemoral retrograde venous radiological studies where successful ligation of the internal spermatic vein(s) at the surgical site was demonstrated, implying varicoceles were most likely to be cremasteric in origin.

In the pre-operative semen analysis, 9 (32.1%) men had a sperm concentration below 12 million per mL and 10 (35.7%) had a progressive motility below 31%. In the post-operative semen analysis of these patients 5 of 9 patients with oligozoospermia had a sperm concentration above 16 million per mL and 5 of 10 patients with asthenozoospermia had a progressive motility above 34%.

Improvement, unchanged and worsening of semen parameters were demonstrated in 13(46.4%), 9 (32.1%) and 4(14.3%) patients. Two men (7.2%), one with anejaculation, had no data (Table 2). The operation was a success in at least 16 (57.1%) patients and was considered a failure in at least 6 (21.4%) patients. In 6 (21.4%) men the above distinction could not be made due to incomplete data.

Discussion

In one-third of young men with varicocele and either oligo- or astheno-zoospermia this operation had improved their fertility potential by nearly 50%

The main outcome measures were disappearance of palpable varicocele on standing, demonstrated in 75% of patients and improvement in semen parameters, observed in 46.4% patients with no significant change in another 32.1% of patients. The operation can be deemed successful in at least 57.1% of men.

Conclusion

The artery-sparing modified Palomo operation is an effective, safe operation for the treatment of primary varicocele, with no evidence of short-term complications in the present series.

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Case Report

Giant vascular malformation of the neck, reconstructed with thoracoacromial artery-based pectoralis major flap

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Abstract:

Vascular malformations are commonly congenital and often present as birthmarks. The estimated prevalence during childhood and infancy is about 4.5%. Even though it can appear anywhere in the body, the commonest site is head and neck region. The risk of bleeding and soft tissue reconstruction is the most challenging aspect of surgical management. Here we present our experience in managing a patient who had a large disfiguring vascular malformation of the anterior triangle of the neck

Keywords:
Vascular malformations

Introduction

Vascular malformations are commonly congenital and often present as birthmarks. The estimated prevalence during childhood and infancy is about 4.5%(1). Even though it can appear anywhere in the body, the commonest site is head and neck region (1). Depending on the size and site of the lesion, clinical manifestation can vary. The risk of bleeding and soft tissue reconstruction is the most challenging aspect of surgical management(2). Pectoralis major myocutaneous flap is a workhorse in head and neck soft tissue reconstructions especially following resection of advanced head and neck tumors. Even though free tissue transfer is cosmetically superior to pedicle-based islanded flaps, due to the ready availability, reliability, and technical advantages, it becomes a convenient choice for many heads and neck soft tissue reconstructions(3).

Case Presentation

A 43 years old gentleman was presented to the surgical clinic with a history of a lump in the chin since birth. It was painless and the size of the lump was increasing gradually. He had no red flag signs. Even though he was worried about the appearance, he had opted not to seek medical advice until two weeks back when he experienced bleeding from the lump following an accidental injury.

Examination revealed a large soft tissue lump measuring 10 cm x 5 cm size involving submental and submandibular triangles bilaterally. The overlying skin looked normal except for the area of the skin ulceration which leads to bleeding (figure 1).

MRI of the face and neck showed a lesion in the subcutaneous plane superficial to the platysma muscle with no evidence of deep extension (figure 2). The Inferior margin of the lesion was noted up to the larynx. The lesion was fed by both inferior alveolar arteries and submental arteries and venous drainage was to the right internal jugular vein.

Surgical procedure

The patient was explained about the procedure and prepared to undergo excision of the lump and soft tissue reconstruction with a thoracoacromial artery-based pectoralis major flap. Preoperative templating and planning were done (figure 3).

The lesion was completely excised in a subplatysmal plane with a clinical margin of 5mm.

Figure 4 shows how the thoracoacromial artery and its pectoral branch were traced, and skin paddle based on this vascular pedicle was marked. The deltopectoral flap was elevated and the lateral border of the muscle was isolated less traumatically. The lateral edge of the muscle was everted to identify the nutritional artery pedicle underneath the fascia attached to the muscle. The muscle was divided lateral to the artery and the myocutanoeous flap was elevated completely islandized by the thoracoacromial artery pedicle. A skin tunnel was made, and the flap was swung into the recipient site without rotation or tension. A flap test was performed to assess the viability and the

blood supply of the flap. Figure 5 shows the immediate postoperative image of the completed flap and the donor site repair. The postoperative period was uneventful, and histology reveals arteriovenous malformation. Figure 6 shows day 14 of a postoperative period of flap and donor site.

Discussion

Vascular malformations are often occult but can slowly grow throughout life and present with symptoms in adulthood. It can appear anywhere in the body; the commonest site is head and neck. Depending on the size and site of the lesion, the clinical manifestation of the lesion is extremely variable. Swelling, pain, bleeding, dysphagia, and upper airway obstruction symptoms are the commonest presentations(1). Our patient presented with bleeding following minor trauma.

Imagining is not necessary for the clinical diagnosis of cutaneous vascular malformations. But imaging helps evaluate the extent of the lesion and for treatment planning, The main modalities of imaging are the doppler ultrasound (USS) and MRI studies. MRI provides better soft tissue details while it is also noninvasive, with no radiation risk, and provides a better 3D reconstructed view than CT. Conventional MRI studies are 100% sensitive, 24% to 33% specific. Specificity is increased up to 95% by Dynamic contrast MR studies. It is a preferred imaging modality for diagnosis, preoperative planning, and post-procedure follow-up(4).

Management decision of a vascular malformation needs to be personalized. Surgical excision, sclerotherapy, embolization are the main treatment options. Minimally invasive endovascular techniques are preferred in cases where main feeding vessels can be identified, and the facilities exist(5).

Complete excision of the lesion without major bleeding and damage to the vital structures and reconstruction of the defects are the major surgical challenges. Cervicofacial advancement, deltopectoral, supraclavicular, and free radial forearm flaps are the options in the reconstructive toolbox.

Reconstruction with Pectoralis major myocutanous flap is convenient. The main blood supply to pectoralis major muscle derived from the throcoacromain artery, lateral thoracic artery, and internal mammary artery and its perforators. We selected this option due to its' reliability and convenience. Although the initial cosmetic outcome is not as superior as a free flap due to the accompanying muscle bulk, this muscle bulk is expected to atrophy significantly over time as the muscle is now denervated(6).

Conclusion

Reconstruction of soft tissue deficit and bleeding are the challenges in vascular malformation surgery. Islandized pectoralis major myocutaneous flap supplied by thoracoacromial artery is a reliable source for the reconstruction.

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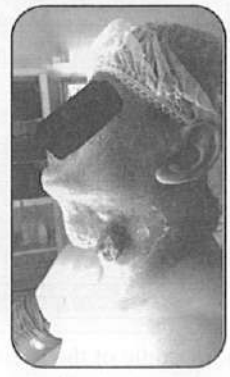

Figure 1 shows a small ulcer in the overlying skin of vascular malfomation lump

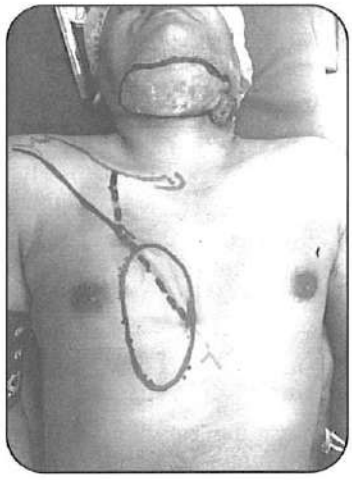

Figure 3 preoperative planning and templating before surgery

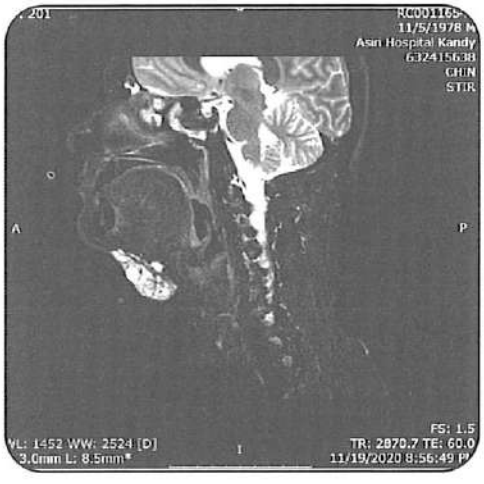

Figure 2 shows of MRI of face and neck showed a lesion with tortuous structure in the chin and the upper neck lying in the subcutaneous plan superficial to the platysma muscle with no evidence of deep extension

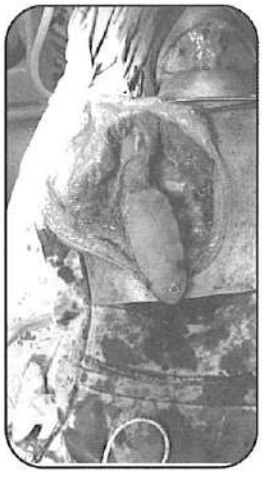

Figure 4 skin paddle of the pectoralis major myocutaneous flap supplied by thoracoacromian artery

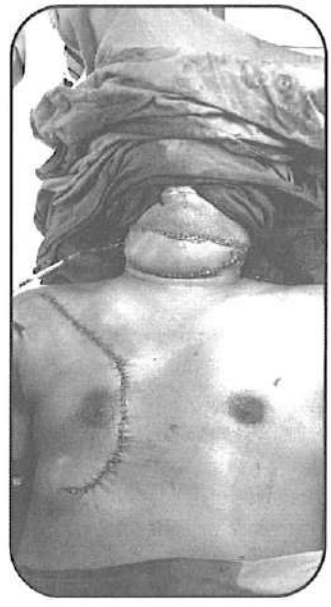

Figure 5 shows the immediate post-operative image of the completed flap and the donor site repair

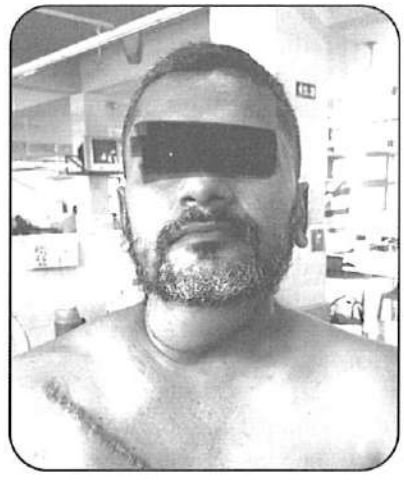

Figure 6 shows the post operative day 14 pic of flap and donor site

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Case Report

An Unusual Presentation of Pulmonary Tuberculosis: A Close mimic of ANCA Associated Vasculitis in Tropics:

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Teaching Hospital Batticaloa

Abstract:

Tuberculosis is one of the commonest communicable diseases in the world. The incidence has been rising specially in Africa and Asia due to the association with HIV and other immunosuppressive conditions such as diabetes mellitus and chronic kidney disease. Clinical manifestations of tuberculosis may range from commonly seen pulmonary tuberculosis to the rarely seen vasculitis with peripheral neuropathy.

This case report illustrates a patient who presented with combined chronic severe sensory motor axonal polyneuropathy and digital gangrene with positive PR3 anti neutrophil cytoplasmic antibody (PR3 ANCA) and was found to have tuberculosis.

Keywords: Tuberculosis Vasculitis
Broncho alveolar lavage

INTRODUCTION

Tuberculosis is caused by mycobacterial species of Mycobacterium tuberculosis complex (MTb). There are four main mycobacterial species, namely ***Mycobacterium tuberculosis, Mycobacterium bovis, Mycobacterium africanum*** and ***Mycobacterium microti.*** The infection develops due to inhalation of bacteria. However, the hosts immune response can lead to the development of latent tuberculosis, primary active tuberculosis and reactivation tuberculosis.

The majority of tuberculosis cases are due to reactivation of latent infection. Reactivation is usually due to immunosuppression as in HIV coinfection, immunosuppressive therapy including corticosteroids, diabetes mellitus, end stage chronic kidney disease, malnutrition and aging. The typical appearance of post-primary tuberculosis are patchy consolidations or linear and nodular opacities1.

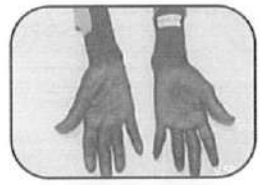
Screening for pulmonary tuberculosis is done using sputum for microscopy, smear and culture. If the patient is unable to produce sputum, induced sputum or bronchoscopy and lavage can be used to obtain respiratory secretions2.

The association of tuberculosis with ANCA associated vasculitis is considered unusual and is a diagnostic challenge, as both share similar features clinically, radiologically and histologically. However when both these conditions are associated, the possibilities are the coexistence of both tuberculosis and vasculitis, antigenic exposure to tuberculosis triggering ANCA vasculitis, incidental finding of ANCA in patients with tuberculosis without pathogenic value and development of tuberculosis while on immunosuppression for vasculitis3.

CASE HISTORY

The patient was a 73-year-old female who got admitted following bilateral upper and lower limb arthralgia and impaired hearing for ten days' duration. She has been a non-vegetarian and was on treatment for anaemia. She had no contact history of tuberculosis. Examination revealed bilateral upper limb wrist drop with sensory motor polyneuropathy and bilateral lower limb stocking type sensory loss with distal muscle weakness.

She had reduced breath sounds over the right lower chest and had saturation of 98% on air. During the hospital stay the patient developed dry gangrene of distal phalanges of left second, third, fourth and fifth fingers.



(Figure 1)

Full blood count	White cell count 13.41*109/l Neutrophils 79.9% Lymphocytes 12.8% Haemoglobin 9.8g/dl Mean corpuscular volume 79.1fl Platelet 512*109/l
Erythrocyte sediment rate	130mm/1st hr
C reactive proteins	186.6 mg/l
Liver profile	Alanine aminotransferase 39u/l Aspartate aminotransferase 42u/l Alkaline phosphatase 138u/l Total protein 72g/dl Albumin 20g/dl Globulin 52g/dl Total bilirubin 5.1µmol/l
Serum urea	2.1 mmol/l
Serum sodium	136mmol/l
Serum potassium	4.2mmol/l
Serum creatinine	39µmol/l
Urine full report	Protein + WBC 1-2/hpf RBC 8-10/hpf
Serum calcium	2.4 mmol/l
Serum magnesium	0.92mmol/l
Serum phosphorous	1.51mmol/l
Serum uric acid	99µmol/l
Retulocyte count	3.37%
Fasting serum sugar	5.29mmol/l
Blood culture	No growth
Urine BenceJones protein	Negative
Immunofixation / BenceJones	No abnormal bands in the separation
VDRL	Non reactive
Retroviral screening	negative
Thyroid function tests	TSH 6.51mIU/l Free T4 0.89ng/dl
Rheumatoid factor	32u/l
APLS screening	DRVTT positive for lupus anticoagulant
Anti nuclear antibody	1:80 negative
Cryoglobulin	Negative
Mantoux test	Negative
Bronchoalveolar lavage for cytology	Acute inflammatory smear
Fasting lipid profile	Total cholesterol 3.13mmol/l Triglyceride 1.43mmol/l HDL 0.34mmol/l LDL 2.14mmol/l
ANCA	pANCA negative PR3ANCA positive

Table 1

The patient's chest X ray revealed right lower zone consolidation. **(Figure 2)**

The blood picture was suggestive of anaemia of chronic disease with evidence of iron deficiency anaemia. Serum protein electrophoresis was suggestive of chronic inflammation with increased acute phase reactants with polyclonal increase in gamma globulins. The skeletal survey revealed no lytic lesions and PR3-ANCA was positive.

The contrast enhanced computed tomography of neck, chest, abdomen and pelvis (CECT-NCAP) showed right middle lobe consolidation and circumferential thickening of mucosa in the second part of the duodenum. Subsequent upper gastrointestinal endoscopy reported oesophageal candidiasis, gastric antral vascular ectasia (GAVE) with normal first and second parts of the duodenum.

The skin biopsy from the edge of the gangrenous digit of the middle finger was not suggestive of vasculitis and the patient did not consent for the repeat biopsy.

The electrophysiological findings were more in favour of combined chronic severe sensory-motor axonal polyneuropathy of lower limbs, whereas the upper limbs studies demonstrated electrophysiological evidences of mononeuritis multiplex. The possibilities were vasculitis, secondary to infective pathology (tuberculosis or leprosy) and "burnt-out" chronic inflammatory demyelinating polyradiculoneuropathy (CIDP).

The pure tone audiometry revealed right sided conductive hearing impairment.

Although her urine protein creatinine ratio (UPCR) was in nephrotic range, the patient did not consent for renal biopsy.

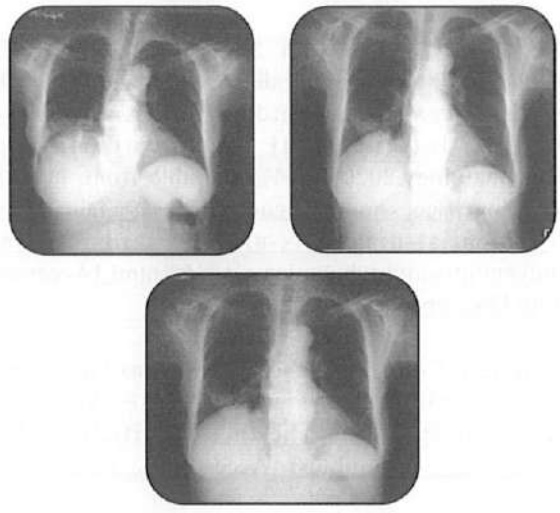
She was clinically diagnosed with possible ANCA associated vasculitis and she was commenced on intravenous methylprednisolone 1g pulses daily for three days when she developed gangrene of her fingers and converted to oral prednisolone for vasculitis. Additionally, she was started on bosentan daily. Since there was renal involvement, intravenous cyclophosphamide was also initiated.

Although she showed only partial response initially, her condition started to decline thereafter.

At eight weeks since admission, the broncho-alveolar lavage sample for Mycobacterium tuberculosis culture became positive. Anti-tuberculosis treatment was started in addition to oral steroids.

The patient's clinical status improved markedly following the commencement of treatment for vasculitis. Her general well-being, appetite and hearing were also improved.

The follow up chest X rays revealed improvement of the consolidation.



DISCUSSION

Pulmonary tuberculosis can present in the same way of systemic vasculitis4. In these instances, the differentiation of tuberculosis from systemic vasculitis necessitate biopsy, serological marker detection and genetic testing for tuberculosis. In the presence of strong clinical suspicion of tuberculosis, the investigations would range from detection of acid fast bacilli in sputum, mantoux test, culture and genetic testing. Tuberculosis related vasculitis is one of the rare clinical manifestations5. The unusual tuberculous granulomatous vasculitis is generally associated with meningitis and retinitis5. Earlier published case reports on tuberculosis and vasculitis has shown cutaneous leukocytoclastic vasculitis5.

In this case, the diagnosis of systemic vasculitis became challenging due to the unavailability of renal biopsy and an inclusiveness of the skin biopsy. Even though PR3-ANCA is considered a sensitive marker of granulomatosis with polyangiitis6 it can be present in patients with tuberculosis without a pathological significance3.

A few case reports revealed tuberculosis presenting as peripheral gangrene, cutaneous ulcers with absent peripheral pulses6and rarely nasal septal perforation7.

CONCLUSION

It is of great importance to consider tuberculosis among patients in highly prevalent regions with clinically and diagnostically non-specific presentation and urge for a high index of suspicion.

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Case Report

Bilateral Thalamic Infarcts due to occlusion of Artery of Percheron: An Uncommon Diagnostic Challenge

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Abstract:

Artery of Percheron is an anatomical variant of the paramedian thalamic vasculature supplying bilateral thalami and posterior midbrain as a single trunk arising from the posterior cerebral artery, occlusion of which results in a spectrum of clinical features including altered mental state, episodes of transient loss of consciousness, aphasia, psychosis, oculomotor dysfunction, vertical gaze palsy, and memory impairment.

This case report is regarding a 71-year-old diabetic female presenting with left-sided hemiplegia and fluctuating level of consciousness associated with vertical gaze palsy with the MRI showing infarction of bilateral thalami due to occlusion of the artery of Percheron.

Keywords: Artery of Percheron, thalamic infarction

Introduction

The artery of Percheron is one of the four main anatomical variants of the paramedian thalamic artery which arises as a single trunk from one of the two posterior cerebellar arteries and divides into two branches supplying bilateral thalami and rostral midbrain [1]

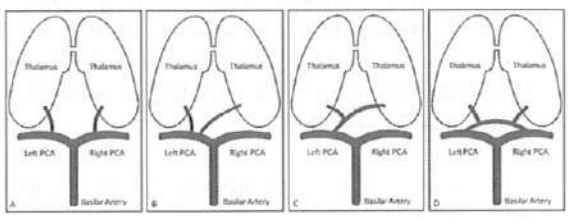

figure 01

Figure 01: Variants of the Paramedian thalamic artery; A – Type 1 (usual anatomy), B – Type IIa (2 single paramedian arteries originating from left PCA, C – Type IIb (the paramedian artery arises as a single trunk from the left PCA, bifurcates and then supply both the thalami and rostral midbrain), D – Type III (an arterial arch connecting the bilateral PCAs and supplying both the thalami) [1]

The thalamus is involved as a station of interchange for the neuronal pathways for motor control, sensation, arousal, cognition and behavior [1]. Dorsal midbrain structures are involved in control of vertical gaze and pupillary reflexes [1]. Therefore, infarction in the territory of artery of Percheron may present with a spectrum of clinical features owing to infarctions in the bilateral thalami and dorsal midbrain [1].

Case history

Our patient was a 71-year-old diabetic female presented to the medical casualty with aphasia and left sided hemiparesis. The neurological examination revealed a GCS of 12/15, bilateral pinpoint pupils (1mm each) with sluggish reaction to light and vertical gaze palsy, left-sided upper motor type facial weakness, flaccid left-sided hemiparesis with a power of 2/5. The basic laboratory investigations and the non-contrast CT scan of the brain done after 6 hours of symptom onset was normal.

2D echocardiogram, carotid and vertebral arterial duplex ultrasound scans were normal with no clinically significant stenosis. The DW1/T2 MRI scan was performed 5 days later which revealed T1 low T2 high areas with diffusion restriction in both thalami on opposed margins on either side of the 3rd ventricle, which was more prominent on the right suggestive of acute bilateral thalamic infarcts due to occlusion of the artery of Percheron.

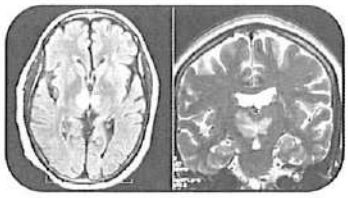

figure 02

Figure 02: Transverse (left) and Coronal (right) sections on MRI showing T1 low T2 high areas with diffusion restriction in both thalami on opposed margins on either side of the 3rd ventricle

She was started on dual antiplatelets and a statin with routine diabetic medications. The patient was not given thrombolytic therapy since the onset of symptoms was beyond the safe window period. Limb physiotherapy was started early within 48 hours. During the hospital stay her left-sided facial, upper limb and lower limb weakness improved within one week up to a power of 4/5. But she continued to have episodes of altered level of consciousness with a GCS of 9/15 with pinpoint pupils. After 10 days, the patient's conscious level improved up to a GCS of 13/15, and the patient was discharged with some residual aphasia and was able to mobilize with a walker.

Discussion

Occlusion of artery of Percheron accounts for 0.1 to 2 % of all ischemic strokes and 4 to 35% of thalamic strokes [6]. Clinical features of the artery of Percheron territory infarction may vary from dizziness and mild confusion to coma [1].

Many case reports in the past have described the initial negative or misinterpreted CT scans or MRI that led to delay in diagnosis [2]. There is only one case of angiographically proven occlusion of artery of Percheron undergone thrombolytic therapy in the literature [3].
Outcome may differ with the anatomical sites of infractions where Bilateral paramedian thalamic infarcts without involvement of the midbrain carry a favorable outcome of 67%, whereas rostral midbrain involvement has only a favorable outcome of 25% [5]. Therefore, thalamic infarcts generally carry a relatively good prognosis concerning mortality and permanent motor deficits except when the midbrain is involved [5].

Conclusion

Due to highly variable and delayed clinical presentation and the initial CT scans usually being negative, it is a diagnostic challenge to identify artery of Percheron territory infarction early and direct the patient to proper therapy such as thrombolysis or endovascular treatment [4]. Therefore, the clinician needs to be able to suspect occlusion of artery of Percheron early and direct towards radiological diagnosis and for intervention since it carries a relatively good prognosis.

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Case Report

Acute Necrotizing Encephalopathy of Childhood Secondary to Influenza, Viral infection

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Abstract:

Acute necrotizing encephalopathy of childhood is an atypical type of fulminant encephalopathy which is associated with catastrophic neurological sequel and sometimes, multi-organ failure. Although initial case reports were predominantly reported in East-Asia, sporadic cases of this disease were subsequently reported across different geographic regions. Early diagnosis is crucial as delayed treatment is associated with high mortality. The authors report a twelve year old girl who presented dramatically with a constellation of multi-focal neurological deficits following a confirmed influenza viral infection. The diagnosis of acute necrotizing encephalopathy secondary to influenza viral infection was made based on supportive neuroimaging findings, virological diagnosis and exclusion of differential diagnosis. MRI showed symmetrical brain stem, and cerebral white matter lesions including thalamic lesions. The child recovered with moderate to severe neurodisability despite early diagnosis and was commenced of intravenous steroids and intravenous immunoglobulin. Now she has been on monthly cyclophosphamide therapy under the guidance of multidisciplinary team.

Keywords:
Acute necrotizing encephalopathy, Steroids, Fulminant encephalopathy

Introduction

Acute necrotizing encephalopathy of childhood (ANEC) is a rapidly progressive and life-threatening disease of brain and characterized by symmetrical supra-tentorial white matter, thalamic, brain stem and cerebellar lesions[1]. The disease has been predominantly reported from East-Asia[2,3] since its first report as a novel illness in 1995[4]. Only sporadic cases have been reported in other regions. ANEC usually follows antecedent viral infections and is seen mostly in children who are otherwise healthy[5]. Although exact aetiology is unknown, interplay between host factors such as individual susceptibility and genetic factors and environmental factors such as prior viral infections[6] are likely triggering off a "cytokine storm"[7] which manifests as acute necrotizing encephalopathy. The clinical presentations of ANEC are often myriad and diagnosis based solely on specific clinical features is not possible[8].

The authors have reported a 12 year old girl who developed catastrophic neurological sequel following an influenza viral illness and in whom the diagnosis of acute necrotizing encephalopathy was made based on neuroimaging, virological diagnosis and exclusion of differential diagnoses.

Case history

A-12-year old girl born to non-consanguineous parents and diagnosed to have right sided lower motor neuron facial nerve palsy 3 months back and on follow up in the neurologic clinic, presented with dizziness, sweating, vomiting, and progressive left-sided lower limb weakness and mouth deviation to right side for one day duration. Further, she was unable to walk and reported persistent headache. Seven days before this presentation, she had been treated for upper respiratory infection with oral antibiotics in the local hospital and also had three episodes of fainting attacks over the preceding month for which no treatment was sought. Her immunization including BCG and development had been age appropriate. There was no family history of neurological diseases.

She was aphasic and irrational on physical examination and temperature was normal. There were no neurocutaneous stigmata. Neurological examination revealed lower limb hypertonia, exaggerated reflexes and low muscle power in both upper and lower limbs. Her gait was ataxic. There was no sensory impairment or bowel and bladder dysfunction. During ward stay, she further deteriorated needing ventilator support for 10days.

Investigation revealed normal white cell counts, C-reactive protein, erythrocyte sedimentation rate (ESR), renal and

liver functions and blood cultures. Antinuclear antibody (ANA), p ANCA (Anti-neutrophil cytoplasmic antibodies), c ANCA and troponin were normal. Cerebrospinal fluid (CSF) analysis was normal except slight increase in protein (45mg/dl). CSF viral studies, cultures for bacteria and tuberculosis including tuberculosis PCR were normal. Coagulation profile was also normal. Mycoplasma, and Epstein Barr virus antibodies were negative. Influenza antibody was positive. Mantoux test was within normal limit (8mm). Chest X-ray had been normal. Echocardiography, electrocardiography, and carotid Doppler revealed normal findings. Electroencephalograph revealed bilateral generalized slowing waveforms suggestive of encephalomyelitis (figure-1). Non-contrast Computerized Tomography (NCCT) showed hypodense area (infarctions) involving brain stem (upper pons) and bilateral thalami (figure-2). Magnetic resonance imaging and angiography (MRI &MRA) revealed acute infarctions of the pons with cavitation and multiple old infarctions involving bilateral thalamus, and right cerebral hemisphere compatible with ANEC (figure3 &4).

Based on clinical presentation, supportive CT, MRI and MRA findings and exclusion of differential diagnosis, the diagnosis of acute necrotizing encephalopathy secondary to influenza infection was made. She was treated with intravenous immunoglobulin, intravenous methylprednisolone and plasma apheresis She demonstrated a steady recovery while on immunomodulation therapy although she was left with residual neurological disability. Currently, she can walk with help; can understand what we talk although she cannot talk. She is on monthly intravenous cyclophosphamide pulses and multidisciplinary follow-up at the Tertiary Care Hospital.

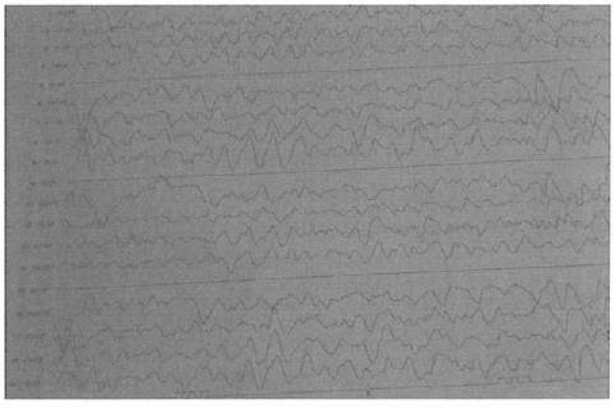

Figure-1: Generalized slowing compatible with encephalomyelitis

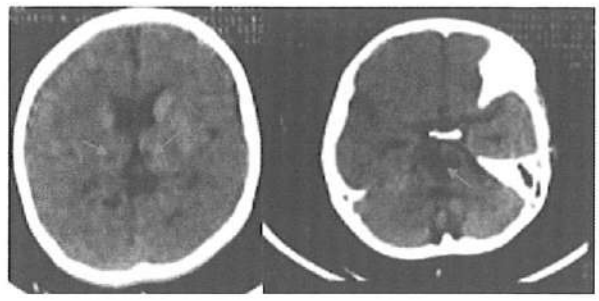

Figure-2: NCCT shows asymmetric hypodense areas (infarction) involving both thalami and the upper pons (Red arrow).

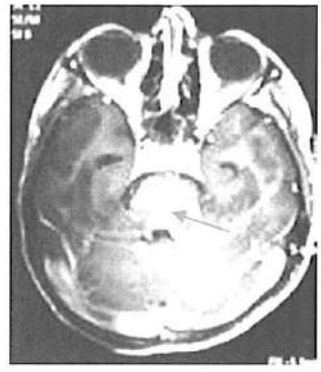

Figure- 3: MRI shows enhancement of pontine area (Red arrow)

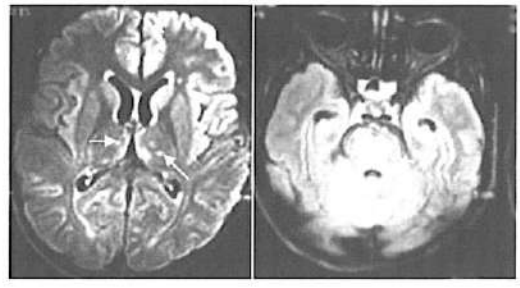

Figure-4: Fluid attenuated inversion recovery (FLAIR) images revealed increased T2 signal intensity in bilateral thalami (red arrows), bilateral supra-tentorial white and grey matter (L>R) (yellow marks), and a cavity forming lesion in upper pons (white arrow)

Discussion

The definitive diagnosis of ANEC is based on (1) acute encephalitis that follows a viral illness, (2) supportive neuroimaging findings, (3) exclusion of differential diagnoses, (4) absent CSF pleocytosis, and (5) presence of mildly deranged liver functions according to its first report in 1995 . However, a myriad of presentations has been observed and most case reports are based on fulfilling initial three criteria. Our child had fulfilled first four criteria at the time of diagnosis. Acute necrotizing encephalopathy type 1 which is a variant and inherited

form of ANE is diagnosed in the presence of family history, recurrent encephalopathy and additional MRI changes.

Acute necrotizing encephalopathy often has numerous presentations and complications. Although the reported child presented only with multi-focal neurological deficits, severe systemic manifestations such as multi-organ failure and disseminated intravascular coagulation have been described in previous reports and are associated with high mortality.

Exclusion of differential diagnoses which are associated with fulminant neurological deficits and similar radiological findings is important in accurate diagnosis of ANEC4. The differential diagnoses include viral encephalitis, hepatic encephalopathy, metabolic and toxic encephalopathies, cerebral infarctions, acute demyelinating encephalomyelitis and cerebral vasculitis.

Definitive treatment of ANEC is yet to be established although immunosuppressive and modulation therapies remain the current cornerstones of treatment . The treatment is aimed at suppressing the "cytokine storm". Intravenous immunoglobulins, steroids and plasmapheresis are used in treatment of ANEC. Whilst some studies have reported superior therapeutic outcomes of steroids , this has not consistently been seen .

Acute necrotizing encephalopathy is associated with high morality of approximately 30% and most children succumb during the first week of disease . Only less than 10% of children make complete recovery and other children are left with mild to severe neurodisability, epilepsy and developmental delay . Involvement of brain stem is considered to be a poor prognostic factor1 whilst commencement of steroid treatment within 24 hours of onset of disease has been reported to be associated with a better prognosis. Despite early commencement of steroids, this child was left was residual neurodisability due to involvement of the brainstem.

Conclusion

Acute necrotizing encephalitis is a fulminant, rapidly progressive disease with catastrophic neurological sequel. Early commencement of steroids and intravenous immunoglobulin within 24 hours of onset of disease is associated with better outcomes although overall mortality remains high.

Acknowledgement

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Conflict of interest

The authors declare that there is no conflict of interest in publishing this article.

Consent for publication

Written informed consent was obtained from patient's legal guardian for publication of this case report. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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Authors' contributions

VT performed clinical management of the patient, did literature survey and wrote and edited the manuscript. KD edited the manuscript. All authors read and approved final version of the manuscript.

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Case Report

Fever and Drowsiness-An uncommon manifestation of Dengue encephalitis in an adolescent girl

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Abstract:

The clinical features of dengue infection vary from subclinical flu-like illness to dengue shock syndrome. As the dengue virus affects all the organs in the body, the manifestations differ from patient to patient. Though dengue is not a neurotropic virus, it is known to cause encephalitis, meningitis, encephalopathy, stroke and Guillain-Barré syndrome. We all clinicians should exclude dengue infection in all patients with a fever with drowsiness as dengue haemorrhagic fever is commonly a treatable cause of encephalitis. Here we report a thirteen-year-old girl who presented with fever and headache for 5 days and drowsiness for one day. While she was managed with dengue haemorrhage fever, she developed several subtle seizures and altered level of consciousness. Later it was treated for dengue encephalitis since dengue IgM and IgG were positive on day seventh of illness. The CSF PCR was negative for herpes and enterovirus. She was discharged after 14days of hospital stay with mild walking difficulties with the follow up in the multidisciplinary team. There were no neurological complications noted on clinic follow up in two years' time.

Keywords:
Dengue encephalitis, Guillain-Barre syndrome. Encephalopathy, stroke

Introduction

Dengue infection is a mosquito-borne disease caused by an RNA virus of the Flaviviridae family. It is more prevalent in tropical countries. As it involves multi-systems of the body encephalopathy might be a common complication of Dengue shock syndrome in addition to hepatitis, coagulopathy, and concurrent bacterial infection (1). But dengue encephalitis is an extremely rare disease and due to direct neuronal infiltration by the dengue virus (2, 3). The involvement of neurological manifestations seen in dengue infection has been classified into 3 categories (2). Those related to the neurotrophic effect of the virus-like encephalitis, meningitis, myositis and myelitis. Those due to the systemic complications of infection like encephalopathy, stroke and hypokalemic paralysis. Lastly, post-infectious complications like encephalomyelitis, optic neuritis and Guillain Barré syndrome (4). Patients who present with altered sensorium and fever in an endemic area of dengue should be considered dengue encephalitis a differential diagnosis of encephalitis. Here we report an adolescent girl presented with dengue encephalitis supported with an electroencephalograph (EEG) and Computerized Tomography, brain.

Case history

A-13-year-old, previously healthy child presented with fever and headache for 5days and drowsiness for 1-day duration. She presented to the local hospital with the history of fever, myalgia and headache for 2days and blood report showed WBC-5.4x103, platelet-235x103, and dengue antigen was not done due to financial constraints. As the child was stable, she was advised to rest and have oral fluids and followed up with the serial blood report at the outpatient department. Unfortunately patient did not follow the instruction as her fever had been mild and felt better than initial days of fever. On day five of illness, she had severe headache and drowsiness, but no fever and directly admitted to Teaching Hospital. On admission, she vomited and had severe abdominal pain. Inward ultrasound abdomen showed mild pleural effusion and pericolic fluid collection and WBC -3.2x103 and platelet-120x103. She had no past history or family history of epilepsy. She had been vaccinated regularly including Japanese encephalitis.

On examination, she was ill, drowsy, GCS-13/15, afebrile (36.4), no neck stiffness, congested conjunctiva and vital signs (BP-120/70, Pulse-140bpm, Capillary refilling time (CRFT) <2sec, warm periphery). Abdominal examination revealed right hypochondrial tenderness and

no organomegaly. Nervous system examination had been normal except drowsy. Rest of the system examination had been normal. She was kept nil by mouth and started intravenous fluids (2ml/kg/hr), antibiotic and acyclovir. Her vital signs had been maintained with the adequate urine output (0.6 to1ml/kg/hour). Repeated investigation showed low WBC (2.2x103, N-44%, L-50%), low platelet (102x103), normal capillary blood sugar (110mg/dL), normal C-reactive protein (<6mg/dl), slightly increased in liver function (AST-68u/l, ALT-52u/l) and renal function had been normal. Malarial test was negative. Arterial blood gas showed a normal finding. She was stable and managed in the ward as there were no bed in the Medical Intensive Care Unit.

On day six, but she developed several subtle and right focal seizures which were managed with anticonvulsant with the dengue monitoring. EEG showed generalized slow waves all the area (figure-1). CT/brain showed normal except cerebral oedema. Then lumber puncture revealed normal finding except mild elevation of protein (54mg/dl). Blood, urine and CSF culture were negative for bacteria. IgM antibodies for Leptospira was negative.CSF/ PCR for herpes and antibody to Ebstain bar virus (EBV) and mycoplasma had been normal. . Dengue serology (IgM& IgG) had been positive on day 8th of illness. ANA, pANCA, cANCA and C3&C4 were also normal limits. Although she recovered from dengue hemorrhagic fever, she continued to be drowsy till day 6 of hospital stay. Since all other causes of possible encephalitis and autoimmune disease had been excluded, she was labelled as dengue encephalitis. The child was discharged on 14 days of hospital stay with mild walking difficulties. Follow up with the multidisciplinary team in two years showed no neurological sequelae and discharged from follow up recently.

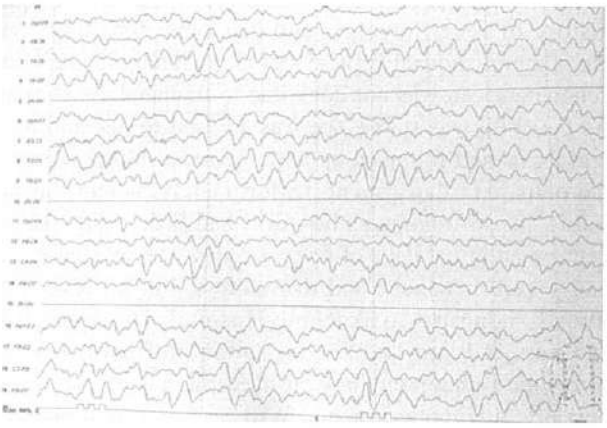

Figure-1: Generalized slowing shows encephalitis

Discussion

The World Health Organization (WHO) surveillance reported that the global incidence of dengue is climbing. There are four serotypes (DENV-1 to DENV-4) identified in dengue which is usually a non-neurotropic virus. Dengue infection commonly causes fever, headache, rashes, and hemorrhagic manifestations. Studies showed that the serotypes, most frequently causing neurological manifestations are DEN2 and DEN3 (5, 6). Dengue encephalopathy is a well-known entity and the incidence ranging from 0.5 to 6.2 %. There are several mechanisms that accounted for dengue encephalopathy include liver failure (hepatic encephalopathy), cerebral hypoperfusion (shock), cerebral edema (vascular leak), deranged electrolytes, and intracranial bleeding. But dengue encephalopathy is different from dengue encephalitis which is thought to be a direct neuronal injury to the brain (5-8). There are some other post-dengue neurological complications reported which include manifestations like transverse myelitis, myositis, and Guillain-Barre syndrome. Solomon et al. & Kankirawatana et al. Kularatne and Misra et al. reported that there are a demonstration of dengue virus and IgM antibody in the cerebrospinal fluids (2, 8) which describes the evidence of direct neuronal injury (2, 8-10).

The main symptoms of dengue encephalitis are headache, seizures and altered consciousness in addition to the other symptoms of dengue fever like myalgias, rash and bleeding (2). Varathraj defined criteria for dengue encephalitis are: i) fever; ii) acute signs of cerebral involvement; iii) presence of anti-dengue IgM antibodies or dengue genomic material in the serum and/or cerebrospinal fluid; iv) exclusion of other causes of viral encephalitis and encephalopathy (11,12). Our patient had a fever in the initial four days with seizures on day six and altered sensorium and we could demonstrate dengue-IgM in his blood and not in the CSF.

We also ruled out other causes for encephalitis by appropriate investigations. So our patient fulfilled the criteria for dengue encephalitis.

MRI findings would be appropriate in dengue-related encephalitis but findings might vary from normal or abnormal. MRI changes could be hemorrhages, cerebral edema, and focal abnormalities involving the basal ganglia, hippocampus and thalamus and perhaps show extensive lesions involving the midbrain, cerebellum, thalamus, and medial temporal region on both sides (4, 12). We only did CT/Brain which showed only cerebral oedema. Prognosis is generally good for dengue encephalitis (13, 14). Our child recovered completely in 2 years of follow up.

Discussion

Dengue encephalitis is considered in the differential diagnosis of fever with altered sensorium, especially in tropical and subtropical countries where dengue is wild. Every clinician must have a high index of suspicion in this regard.

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I would like to thank Director Teaching Hospital Batticaloa and all the ward staff who supported to treat this patient.

Conflict of interest

We declare that there is no conflict of interest and patient has consented to publish this case.

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Self-funded

Authors' contributions

VT performed clinical management of patient, did literature survey, wrote manuscript and edited the manuscript. KD edited the manuscript. All authors read and approved final version of the manuscript.

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