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Editorial

Artificial Intelligence in Medical Research

Artificial Intelligence (AI) is here to stay! And it is going to play an ever-increasing role in our daily lives. Likewise, the integration of AI into medical research is undeniable and carries the potential for unparalleled advancements in the field of healthcare. It is an opportunity which must not be missed by the present generation of researchers.

The benefits of integrating AI into research activities are many. AI algorithms can analyze vast datasets, identify patterns, and suggest correlations that might be missed or disregarded by the human eye. It can generate hypotheses, design experiments, and optimize study parameters more effectively. Furthermore AI-driven predictive models can forecast potential outcomes, and aid researchers in making informed decisions about the direction of their studies. Conventional methods of data analysis often struggle to cope with the complexity and scale of biomedical data. AI algorithms, on the other hand, can easily extract meaningful information from large datasets and uncover hidden relationships and correlations.

Already the impact of AI healthcare is being felt in the development of new drugs and in the analysis of genomic sequencing data, medical imaging, and clinical trial data. AI-powered analytics holds the promise of unlocking new avenues for research and innovation.

Despite its immense potential, the integration of AI in medical research is not without challenges. Skepticism, fear of the unknown, and concerns about algorithmic bias misused by unscrupulous researchers are among the obstacles that must be addressed. It is imperative that we see the immense potential of AI and include its application in all stages of research activity.

The benefits it will contribute towards medical research are undeniable. From facilitating the planning and execution of studies to revolutionizing the analysis and reporting of results, AI holds the key to unlocking new frontiers in healthcare. Rather than fearing its implications, the medical community must embrace AI as a catalyst for innovation and discovery. By doing so, we can achieve the goal of “personalized medicine for all”.

Chief Editor
Dr G.R. Francis

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Original Papers

Knowledge and attitude on leprosy among healthcare workers

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Abstract:

Introduction: Leprosy is a chronic progressive bacterial infection leading to grave disabilities, if left untreated. In 2019, Batticaloa District reported 126 new cases, which was the fourth highest in the country. Caseload-wise, the eastern province comes second only to the western province. Adequate knowledge and favourable attitudes among healthcare workers are quintessential for the early detection and treatment of affected persons. Therefore, we decided to assess the knowledge and attitude towards leprosy in healthcare workers.

Objective: The purpose of this study was to assess the knowledge and describe the attitude towards leprosy among healthcare workers in Teaching Hospital Batticaloa.

Method: A descriptive study was carried out among 348 health-care workers, in Teaching Hospital Batticaloa. Stratified random sampling was done and a pre-tested, self-administered questionnaire was used to collect data. Collected data were analyzed using SPSS version 26.

Results: A total of 348 healthcare workers participated. Overall, half of the participants had adequate (51.1%) knowledge while 15.5% had poor knowledge. Almost 100% of the doctors and 70% of the nurses had good knowledge while 60% of the midwives and 56% of the health assistants had inadequate knowledge. Two-thirds (60.9%) knew that leprosy is transmitted through inhalation. Just over a third (37.9%) believed brief interaction can lead to transmission. Two-thirds knew that a patient on treatment could no longer transmit the disease. Although inclusively 64% showed positive attitudes, doctors and nurses were overrepresented. Almost 40% reported that they were scared of leprosy, they would not want to shake hands with patients, they would not sit next to them and would not reveal to a friend if they were diagnosed with leprosy, respectively. All participants agreed that they would seek medical care if they were diagnosed with leprosy.

Conclusion: A notable difference in knowledge level and attitude was noted between the doctors, paramedics and nurses, and the rest of the categories. This knowledge gap and poor attitude among the first-line health workers could lead to a delay in diagnosis and hinder timely treatment, leading to an increased risk of disease transmission.

Keywords: Leprosy, Knowledge, Attitude, Healthcare Workers.

Background

Leprosy is a chronic progressive disease that causes physical disability and disfigurement. It is described in ancient literature in many parts of the world. The causative organism Mycobacterium leprae, was first described by G. H. Armauer Hanson from Norway in the 19th century when leprosy was a common public threat in Europe. Incidentally, it was the first bacterium ever discovered. Following the recommendations made by Hanson, patients were isolated, and the incidence of leprosy gradually declined in Norway. (Irgens 2002)

Because of the relatively stable genome of the leprosy bacteria, geneticists have been able to point out the origins of this illness to the African continent and Europe. Migration, slave trade and colonization have been identified as ports of transmission of the disease to the rest of the world. (Monot et al 2008)

Today, leprosy has been labelled as a neglected tropical disease by the World Health Organization, with high incidence seen in the southeast and south Asian countries. Sri Lanka has been identified as one of the 23 Global Priority Countries in leprosy with 1025 new cases reported in 2021. Out of these 657 were multi-bacillary disease cases and 109 were children. The completion rate of treatment was 82% and the number of relapse cases is 35. (Anti-leprosy Campaign),(WER 2021)

The United Nations set a goal for the complete eradication of leprosy in 2022. However, due to the long period of Mycobacterium laprae dormancy and late presentation, it was seen as infeasible and, the WHO shifted towards a strategy focusing on early detection to reduce disabilities. (Weekly Epidemiological Record, 2022)

Mycobacterium leprae is a slowly multiplying obligate intracellular acid-fast bacilli. The severity of the disease depends on the cellular immune status of the affected individual. The disease expresses itself in a spectrum between a multi-bacillary disease with several lesions and the pauci-bacillary disease with a lesser number of lesions. Patients are usually asymptomatic at the initial stage and remain in this stage for as long as 20 years before the disease manifests. The organism mainly attacks the skin and peripheral nerves in the hand, feet, and eyes causing numbness or weakness in the affected area. When the eyes are affected it results in loss of vision. Leprosy is strongly believed to be spread via the respiratory system through nasal droplets.

Leprosy is treated with the WHO-recommended six-month and two-year multi-drug treatment regime, including rifampicin, for pauci-bacillary and multi-bacillary diseases, respectively. (Emedicine Leprosy, 2023)

A high number of child cases, late presentation, and a high number of multi-bacillary types of leprosy are key problems currently faced by Sri Lanka. Stigma and discrimination due to the disease are identified as major problems in controlling the disease (Anti-Leprosy Campaign).
Leprosy is commonly known as Hansen's disease, not only to honour the work of Hansen but also to outweigh the stigma related to the illness. Leprosy can be taken as the archetypical condition of discrimination and neglect. Barret describes the destructive process of stigma caused by leprosy starting with concealment followed by internalization by the patient ending in disfigurement and poor self-esteem. Concealment leads to delay in diagnosis and treatment as well as discontinuation of treatment. The root cause of stigma is the lack of knowledge and understanding about leprosy in the community and in some instances the healthcare workers. (Barrett, 2005)

Several studies attributed delayed diagnosis of leprosy to the use of traditional medicine, misconceptions and prejudice among healthcare workers and people affected with leprosy, ignorance of leprosy, beliefs, unavailability of skilled healthcare workers, stigma, and influence of traditional or community leaders. This set of interrelated factors suggests that sufficient knowledge of leprosy presentation, clinical features and services, and stigma reduction are essential for the early detection of leprosy (Pal et al., 2010). (Wijeratne, Ostbye 2017)

The objective of our study was to determine knowledge and attitude toward leprosy among health-care workers in Teaching Hospital Batticaloa.

Methodology

This is an institution-based cross sectional descriptive study, carried out in Teaching Hospital Batticaloa. The study was conducted among healthcare workers in Teaching Hospital Batticaloa. During the time of study, there were 1758 healthcare workers at THB. A sample size of 348 was derived using the Krejcie and Morgan formula. Stratified sampling was done according to the proportion of the staff categories.

A newly developed questionnaire, validated by subject experts to establish the judgmental validity was used. Validation was done by a Public Health Inspector and two dermatologists, to establish face validity

and content validity. After a brief introduction to the study and obtaining consent, the participants filled the questionnaire themselves.

The study was conducted after receiving ethical approval from the ethical review committee of Eastern University Sri Lanka. Permission was taken from the director in THB that we expect to conduct our study.

Data were entered into a database created using Microsoft Excel and were analyzed using Statistical Package for the Social Sciences (SPSS) software (26th version).

Results

Socio Demographic Characteristics of the Subjects

Table 1. Socio demographic characteristics of participants

Socio demographic data	Frequency (n)	Percentage (%)
Age		
25- 35	229	65.8
36- 45	91	26.1
>46	28	8.1
Occupation		
Doctors	55	15.8
Nursing officer	129	37.1
Midwives	10	2.9
Paramedics	23	6.6
Health assistants	126	36.2
Others	5	1.4

Table 2. Knowledge on clinical manifestation and complications of leprosy

Knowledge question	Correct answer(%)	Incorrect/don't know the answer(%)
1. Small pale lesion anywhere on the body with sensory loss.	211(60.6%)	137(39.4%)
2. Skin nodules	216(62.1%)	132(37.9%)
3. Reddish skin lesion	250(71.8%)	98(28.2%)
4. Fever	235(67.5%)	113(32.5%)
5. Nasal congestion	231(66.4%)	117(33.6%)
6. Thickened nerves	235(67.5%)	113(32.5%)
7. Hair loss in eyebrows	188(54%)	160(46%)
8. Increasing peripheral neuritis	240(69%)	108(31%)
9. Deformity of the face	223(64.1%)	125(35.9%)
10. Can you identify a leprosy patient by their appearance in the later stage?	319(91.7%)	29(8.3%)

Table 3. Knowledge on epidemiology and treatment of leprosy

Response (correct response %)	Designation%					
	Doctors (n= 55)	**Nursing officers (n=129)**	**Midwives (n=10)**	**Paramedics (n=23)**	**Health Assistant (n=126)**	**Others (n=5)**
Have you heard of leprosy?	100	100	100	100	100	100
Leprosy disease is a Infectious skin disease	94.5	90.7	80	73.9	67.5	40
What do you think causes leprosy? Bacteria	100	87.6	60	87	78.6	80
How does it spread? Via respiratory droplets of the leprosy patient.	92.7	82.9	60	56.5	24.6	60
Transmission may also be via brief interaction such as shaking hands.	92.7	82.9	60	56.5	28.6	60

Statements						
Can you identify a leprosy patient by their appearance in a later stage?	100	97.7	80	87	84.1	80
Leprosy is endemic in Sri Lanka.	63.6	54.3	30	39.1	51.6	60
Is leprosy curable?	100	76	80	91.3	57.1	40
Can a person with leprosy undergoing treatment transmit the disease?	92.7	82.9	60	56.5	27	60
Is there any vaccine available against leprosy?	76.4	68.2	40	56.5	49.2	40
Does leprosy lead to permanent deformities & disabilities if left untreated?	100	97.7	90	91.3	78.6	40
Inadequate knowledge	00.0	10.6	60.0	13.0	55.6	60.0
Moderate knowledge	10.9	21.7	20.0	73.9	22.2	20.0
Adequate knowledge	89.1	67.7	20.0	13.0	22.2	20.0

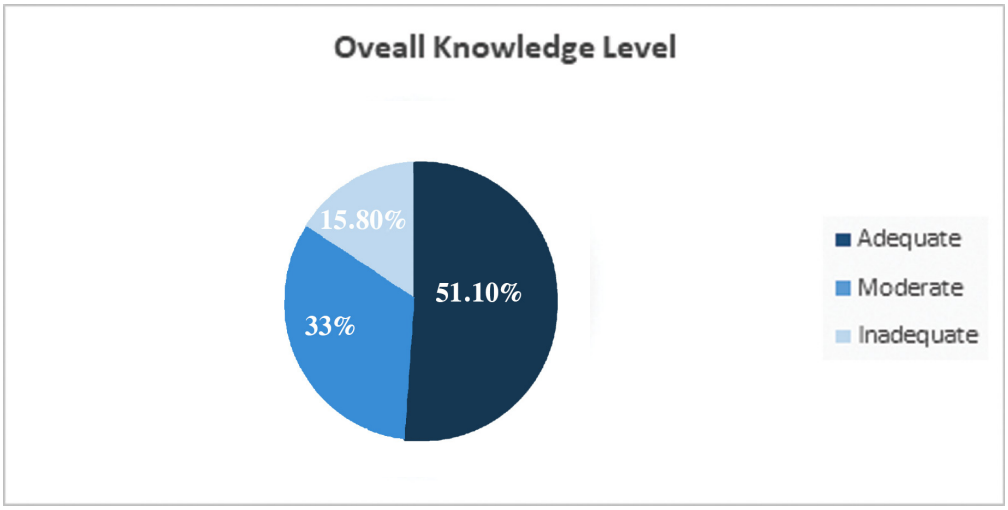

Figure 1. Knowledge level of the participants

Attitudes towards leprosy

Statements (n=348)	**Positive statement (%)**	**Negative statement (%)**
Are you afraid of leprosy? (positive attitude is “no”)	216 (62.1%)	132(37.9%)
Do feel scared when you see a leprosy patient? (positive attitude is “no”)	218(62.6%)	130(37.4%)
Will you shake hands with a leprosy patient? (positive attitude is “yes”)	214(61.5%)	134(38.5%)
Would you mind sitting next to a leprosy patient? (positive attitude is “yes”)	217(62.4%)	131(37.6%)
Would you feel uncomfortable to share public transport with a leprosy patient? (positive attitude is “no”)	215(61.8%)	133 (38.2%)
Would you seek medical help if you think you might have leprosy? (positive attitude is “yes”)	348(100%)	0
If you had leprosy, firstly you would talk about it with,		
Your friend	224(64.4%)	124(35.6%)
Your family	277(79.6%)	71(20.4%)
Healthcare workers	348(100%)	0
Statements (n=348)	**Positive statement (%)**	**Negative statement (%)**
If someone in your family had leprosy, firstly you would talk about it with,		
• **A healthcare worker**	348(100%)	0
• **Clergy**	0	0
• **No one**	0	0
Would you agree to work with someone on treatment or has completed treatment for leprosy? (positive attitude is “yes”)	211(60.6%)	137(39.4%)
Are you willing to manage/ treat a patient suffering from leprosy? (positive attitude is “yes”)	216(62.1%)	132(37.9%)

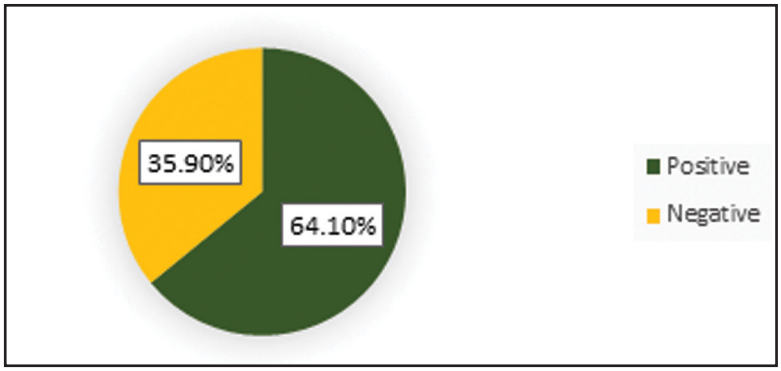

Figure 2. Attitude level

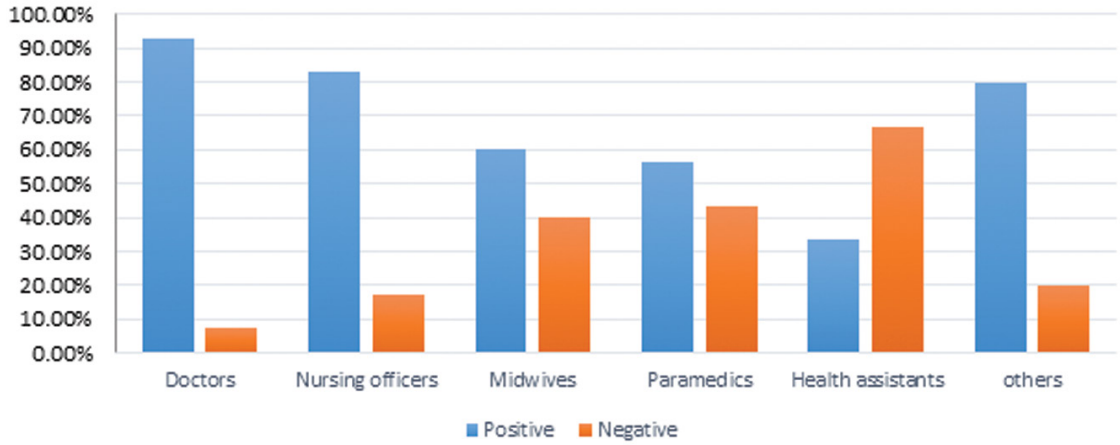

Figure 3. Attitude level vs Occupation

Discussion

A total 348 of healthcare workers participated. Overall, half of the participants had adequate knowledge while 15.5% had poor knowledge. (Figure 1). Table 1 shows that 90% of the doctors and 70% of the nurses had adequate knowledge of leprosy, while the figures were 20% and 22% for the midwives and health assistants respectively. The paramedical staff had better knowledge (73% with moderate and 13% with adequate knowledge) than the midwives and health assistants. Sixty per cent of the midwives and 56% of the health assistants had inadequate knowledge. This lack of knowledge in a set of staff who work in close contact with patients is a cause for concern, as this may lead to issues like delayed detection and patient neglect. Periodic educational programmes involving all categories of staff may alleviate this lack of knowledge.

It is widely postulated that leprosy is transmitted by droplet inhalation (Emedicine/ Leprosy (2023). In our study, only two-thirds (60.9%) were aware of this mode of transmission. More than one-third (36.5%) believed that leprosy is transmitted through skin contact and 37.9% believed brief interaction can lead to the transmission. Personnel working with leprosy patients or those who are at risk of exposure to leprosy patients should be advised to follow basic infection control methods such as wearing masks and maintaining hand hygiene. More investigation needs to be done to determine the exact mode of transmission of leprosy.

The knowledge level reported from a similar study conducted in the Philippines, Rizal Medical Center among healthcare workers reported that only 36.2% of healthcare workers had high knowledge on leprosy. These results do not discriminate the level of

knowledge among the different categories. (Guia et al 2022)

When it comes to attitude towards another person affected with leprosy, 60% of healthcare workers had a positive attitude. However, here again, the doctors and nurses are over-represented, while in the health assistants' category, negative attitudes predominated. The poor knowledge in this group as seen above, may have led to misconception and fear.

Almost everyone in all categories reported that they will seek medical advice and follow treatment in case they were affected by the disease. This is a promising trend, which needs to be capitalized in promoting health-seeking behaviour in the community.

A study conducted in public health workers in the Colombo Municipal Council Area in 2015, showed a comparable knowledge level, yet a poorer attitude compared to our study. (Wijeratna. 2017)

Conclusion

Doctors, nurses and paramedical staff had better knowledge and attitude towards leprosy compared to midwives and health-assistants. This knowledge gap and poor attitude among these first line health workers could lead to a delay in diagnosis and hinder timely treatment, leading to an increased risk of disease transmission. Inclusion of all category of health staff in awareness programmes such as World Leprosy Day events may help improve this gap in knowledge and attitude.

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A description of thyroid cancer histology subtypes over 10-year period from 2011-2020 at teaching hospital Batticaloa

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Abstract:

[Introduction]Thyroid cancer is the most common malignant disease in endocrine system and is rapidly increasing in incidence worldwide. Currently it is the 2nd most common cancer among Sri Lankan women. Differentiated thyroid carcinoma (DTC) includes papillary and follicular types and they are the commonest thyroid cancers. Medullary and anaplastic types of thyroid cancers are other few of the histological types.

[Objectives] To describe the prevalence of different thyroid cancer histology subtypes according to the gender and age categories reported at Teaching Hospital Batticaloa (THB)

[Methodology] This retrospective descriptive study was carried out based on cancer database at histopathological unit THB. Study included 235 thyroid histology reports from 1st of January 2011 to 31st of December 2020. Permission for collecting data was obtained from the Director, THB. Ethical clearance for the study was obtained from Ethical Clearance Committee, Faculty of Health-Care Sciences, Eastern University, Sri Lanka.

[Results] This study had 83.8% (N=197) of females and 16.2% (N=38) of males. In both genders, the commonest histological type was papillary (n = 155, 66%) followed by follicular (n = 60, 25.5%), medullary (n = 15, 6.4%), anaplastic (n = 5, 2.1%) within the 10-year period. Each year papillary cancer was the most prevalent type except 2013, where the follicular type was commonest. Follicular type was the second commonest type during the 10-year period except 2013, 2014 and 2020. In 2013 the papillary type was the second commonest and in 2014 and 2020, medullary cancer was noticed in second place. Anaplastic type was the least reported during each year and wasn't noticed during 2012, 2013, 2015, 2016, 2019 and 2020. Males had no reported cases of anaplastic cancer during the 10-year period. Majority of cancer cases were prevalent between 15-59 years old and the papillary carcinoma was the predominant one in this age group. Anaplastic type was more common above 60 years old.

[Conclusion] The most prevalent types of thyroid carcinoma reported at THB belongs to DTC. But there were considerable number of medullary types with certain peaks during 2014 and 2020 and a few cases of anaplastic type during the 10-year period. There was no fixed trend identified in the prevalence of different histological types during the 10-year period.

Key words: Thyroid cancer, Histological subtype, Follicular, Papillary, Medullary, Anaplastic

Introduction

Thyroid cancer is the most common malignant disease in endocrine system and its frequency is increasing worldwide (Kilfoy et al., 2008). It is the 2nd most common malignancy among the Sri Lankan female population (Health bulletin 2018). Thyroid cancer is classified in to four histological types; papillary thyroid carcinoma, follicular thyroid carcinoma, medullary thyroid carcinoma, and anaplastic thyroid carcinoma. Papillary and follicular thyroid carcinoma are major differentiated thyroid carcinoma which consists more than 90% of thyroid cancers (Rossi et al., 2021). The incidence of differentiated thyroid cancer is increasing in developed countries (Liu et al., 2001). The incidences of all types of malignancies have been increasing internationally, the increase has been more among the developing world and Asian region compared with the Western countries (Liu et al., 2001; Wartofsky, 2010; Davies & Welch, 2014; Maxwell et al., 2014). Various studies conducted in the USA during different time periods have shown that there has been a rise in the incidence of thyroid cancer. This increase has been noted more among the female gender compared to male population (Davies & Welch, 2014).

The increasing incidence of malignancies can have a considerable impact on the economy and the health care system. (Aschebrook-Kilfoy et al., 2013). The management of thyroid cancers requires surgery and adjuvant radioactive-therapy. Countries with economic burden struggle in delivering a comprehensive health care for malignancies (Janovsky et al., 2018). Therefore, identifying trends of thyroid cancer is important which can help the resource limited countries to plan and utilize health resources more effectively.

According to 2016 Health Bulletin, there was a gradual increase in thyroid cancer in Sri Lanka. There has been a significant increase of thyroid cancer among the Sri Lankan population; age standardized increase of thyroid cancer was observed from 2.44 per100000 in 2001 to 5.16 per100000 in 2010 (Jayarajah et al., 2018). Similarly, the malignant trend also has changed within the Sri Lankan population. Compared to the past, now thyroid cancer is the second commonest malignancy. Analysis of national cancer registry data between 2001-2010 (Jayarajah et al., 2018) in Sri Lanka has shown a rise in the incidence of papillary thyroid cancer, which increased from 1.64 to 3.61 per 100,000 population. Follicular type had a smaller increase from 0.56 to 0.95. Rest of the histological types of thyroid cancer had no increases in incidence. This analysis showed papillary as the commonest histological type (n = 5302, 69%) followed by follicular (n = 1411, 18.4%), medullary (n =138, 1.8%), anaplastic (n = 285, 3.71%) and other rarer varieties (n = 545, 7.1%).

There is no any detailed data or study analysis conducted in Eastern Province, Sri Lanka as well as Batticaloa district regarding incidence and trends in Thyroid cancer and histopathology sub types. This study describes the histological sub type of thyroid cancer incidence trends from 2011-2020 among patients confirmed with thyroid cancer in Teaching Hospital Batticaloa.

Methodology

This was retrospective descriptive study and it was carried out based on cancer data base at histopathological unit Teaching Hospital Batticaloa. Permission for collecting data was obtained from the Director of Teaching Hospital Batticaloa, and from the Head of the histopathology unit Teaching Hospital Batticaloa. Ethical clearance for the study was obtained from Ethical Clearance Committee, Faculty of Health-Care Sciences, Eastern University, Sri Lanka. Data was collected through a data collection sheet by investigators from the cancer database.

Convenience sampling method was used including all the patients who were diagnosed with thyroid carcinoma at Teaching Hospital Batticaloa from 1st of January 2011 to 31st of December 2020. Details of 235 study samples with regard to age, gender and histological subtype of the thyroid cancer were collected from the thyroid database. The data sheet was coded and subjects were identified by a number and not by their names. The descriptive analysis was employed in detecting dispersion and calculation of percentages by SPSS software package.

Results

Distribution of Thyroid Cancer during the 10-year period

The database had 235 thyroid carcinoma details confirmed at Histopathology laboratory, Teaching Hospital, Batticaloa. It included females (n = 197, 83.8%) & males (n=38, 16.2%) with a male to female ratio of 1:5.18. There were more thyroid cancer cases

among females compared with male population.

The annual distribution of thyroid cancer is shown in Table 01 for the 10- year study period. The maximum number of cases 14.04% (n=33) has been reported in year 2016 and the annual data doesn't show any increasing or decreasing cancer incidence during the 10-year study period. The reported cases have reduced during some of the years and has shown a sudden increase on and off (Table 01).

The female gender had more thyroid cancer patients from 2011 to 2020 compared to male patients (Table 01). The prevalence showed a distribution of 72%-100% of thyroid cancer among the females during this 10-year period. During the year 2011, 93.5% (n=29) of total confirmed thyroid cancers were of female. In 2020, 81.3% are of female. A majority 100% female thyroid cancer reported in Teaching Hospital Batticaloa in the year 2017 (Table 01). No male was diagnosed with thyroid cancer in the year 2017 and during rest of the period, the prevalence has been very minimum. Each year, female predominance was observed and there was 4:1 ratio among females and males from 2018 to 2020 (Table 01).

Table 01: Annual distribution of thyroid cancer among both genders

Diagnosed Year		Gender		Total
		MALE	FEMALE	
2011	Count	29	2	31
	% within Diagnosed Year	93.5%	6.5%	100.0%
2012	Count	22	7	29
	% within Diagnosed Year	75.9%	24.1%	100.0%
2013	Count	18	7	25
	% within Diagnosed Year	72.0%	28.0%	100.0%
2014	Count	13	2	15
	% within Diagnosed Year	86.7%	13.3%	100.0%
2015	Count	24	4	28
	% within Diagnosed Year	85.7%	14.3%	100.0%
2016	Count	28	5	33
	% within Diagnosed Year	84.8%	15.2%	100.0%
2017	Count	17	0	17
	% within Diagnosed Year	100.0%	0.0%	100.0%
2018	Count	12	3	15
	% within Diagnosed Year	80.0%	20.0%	100.0%
2019	Count	21	5	26
	% within Diagnosed Year	80.8%	19.2%	100.0%
2020	Count	13	3	16
	% within Diagnosed Year	81.3%	18.8%	100.0%
Total	Count	197	38	235
	% within Diagnosed Year	83.8%	16.2%	100.0%

Prevalence of different histology subtypes during the 10-year duration

The commonest histological type was papillary (n = 155, 66%) followed by follicular (n = 60, 25.5%), medullary (n = 15, 6.4%), anaplastic (n = 5, 2.1%) within the total sample. The annual distribution of identified various histological types of thyroid cancer for the 10-year duration is shown in Table 02. When considering the histopathology subtypes, there is no uniform trend in the incidence of thyroid cancer among each subtype (Figure:01). Each year papillary cancer was noted among the majority of diagnosed patients, followed by follicular cancer. But in year 2013 follicular type was the commonest histology type followed by the papillary carcinoma. In 2014 and 2020, medullary cancer was noticed in second place next to papillary carcinoma. In 2011, 2013, 2017 and 2019 medullary and anaplastic cancer equally ranked third place. No medullary cancer reported during 2018 and 2019.The anaplastic subtype was reported during 2011, 2014, 2017, and 2018 and wasn't noticed during 2012, 2013, 2015, 2016, 2019 and 2020 (Table 02).

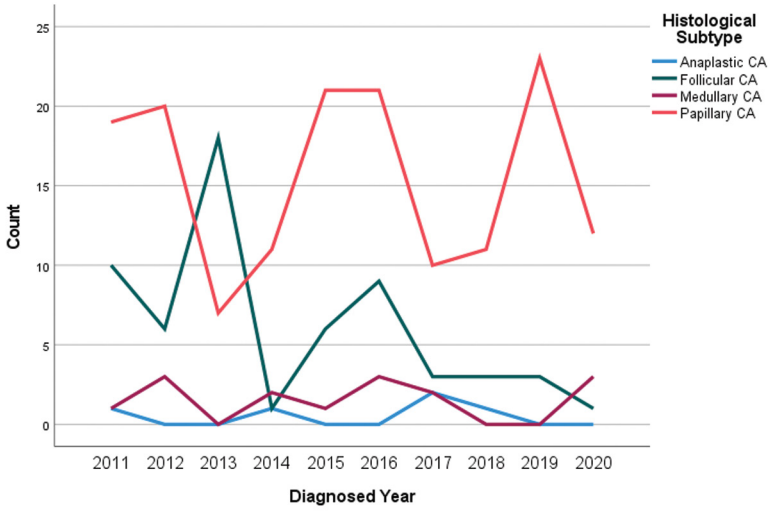

Figure 01: Variation of each histology type during 10-year period

Among the males, the commonest was papillary cancer (n=28, 73.7%), followed by follicular cancer (n=7, 18.4%), medullary cancer (n=3, 7.9%) during the 10-year period. There were no reported cases of anaplastic cancer among males. Medullary carcinoma was reported only in 2016 and 2020. Except 2016 and 2020, papillary carcinoma was the commonest type among males during the 10-year. Follicular cancer was predominant in 2016 and 2020.

Among the females, majority had papillary carcinoma (n=127, 64.5%), followed by follicular cancer (n=53, 26.9%), medullary cancer (n=12, 6.1) and anaplastic cancer (n=5, 2.5%). Except 2013, papillary carcinoma was the commonest among females during the 10-year period. In 2013, the follicular type was the predominant type. Medullary carcinoma was noticed as the second commonest type in 2014 and 2020. During the rest of the period (except 2013,2014 and 2020), follicular carcinoma was the second most prevalent. No medullary cancer cases were reported during 2013, 2018 and 2019. During 2020, papillary and medullary cancers were the only thyroid cancer types reported. Anaplastic cancer only reported during 2011, 2014, 2017 and 2018.

The total prevalence of thyroid cancer or different histological types in both genders didn't show any increasing or decreasing pattern during the 10-year period. The prevalence of these different histological types has been random throughout the 10-year period. But the male population didn't have any incidence of anaplastic type during the 10-year.

When considering the different age groups and the different histology types (Table 03); papillary, follicular and medullary shows a pyramidal pattern. These three types were more prevalent in the age groups between 15-59 years old. The peak is noted between 30-44 years old. Anaplastic cancer was noticed between 30-74 years old and the peak was noticed among 60-74 years old.

			Histological Subtype				
			Anaplastic CA	Follicular CA	Medullary CA	Papillary CA	Total
Age Group	Age 0-14	Count	0	0	0	6	6
		% within Age Group	0.0%	0.0%	0.0%	100.0%	100.0%
		% within Histological Subtype	0.0%	0.0%	0.0%	3.9%	2.6%
	Age 15-29	Count	0	12	4	37	53
		% within Age Group	0.0%	22.6%	7.5%	69.8%	100.0%
		% within Histological Subtype	0.0%	20.0%	26.7%	23.9%	22.6%
	Age 30-44	Count	1	22	5	59	87
		% within Age Group	1.1%	25.3%	5.7%	67.8%	100.0%
		% within Histological Subtype	20.0%	36.7%	33.3%	38.1%	37.0%
	Age 45-59	Count	1	19	3	36	59
		% within Age Group	1.7%	32.2%	5.1%	61.0%	100.0%
		% within Histological Subtype	20.0%	31.7%	20.0%	23.2%	25.1%
	Age 60-74	Count	3	6	3	16	28
		% within Age Group	10.7%	21.4%	10.7%	57.1%	100.0%
		% within Histological Subtype	60.0%	10.0%	20.0%	10.3%	11.9%
	Age 75+	Count	0	1	0	1	2
		% within Age Group	0.0%	50.0%	0.0%	50.0%	100.0%
		% within Histological Subtype	0.0%	1.7%	0.0%	0.6%	0.9%
Total		Count	5	60	15	155	235
		% within Age Group	2.1%	25.5%	6.4%	66.0%	100.0%
		% within Histological Subtype	100.0%	100.0%	100.0%	100.0%	100.0%

Table 03: Histological Subtype with different Age Groups

Discussion and Conclusion

This study showed that the prevalence of thyroid cancer is higher in the female population compared to male population (male: female=1:5.18). Studies from various regions have showed different male: female ratios. But in all those findings females had the most prevalence of thyroid cancer. A study conducted in Saudi Arabia showed male: female ration of 0.3:1, another study carried out with Lithuanian Cancer Registry showed male: female ratio of 1:3 and another study in Malaysia showed male: female ratio of 1: 5.7 (Smailyte et al., 2006; Hussain et al., 2013; Hassan-kadle et al., 2021). The variation in these ratios could be due to differences in the characteristics of the studied population, facilities available for early detection and differences in the health seeking behavior.

According to this study the commonest histological type was papillary (n = 155, 66%) followed by follicular (n = 60, 25.5%), medullary (n = 15, 6.4%), anaplastic (n = 5, 2.1%). The similar pattern was noticed among both genders, while the male population had no recorded anaplastic carcinoma during the 10-year period. Majority of the cases were diagnosed between 15-59 years old peaking during 30-44 years old. The findings from other parts of the world also showed similar order in the prevalence of different histological types. This can be discussed with the following study findings;

One study from Romania (Teodoriu et al., 2021) showed; papillary carcinoma (63.10%) was the commonest followed by follicular carcinoma (14.7%), medullary carcinoma (6.74%) and anaplastic thyroid carcinoma (1.02%). Also, the findings from this study showed that papillary carcinoma had the annual highest incidence among both genders while the other histological types had fluctuations with the time. The peak number of thyroid carcinomas was detected in the age group of 51–60 years. Another study from Iran (Safavi et al., 2016) showed that papillary carcinoma was the commonest and anaplastic carcinoma was the least prevalent. The trends for other types showed a fluctuation with time especially for follicular type. The incidence of papillary cancer was higher in females and the incidence of anaplastic and medullary cancer was higher in men.

A multinational study carried out based on data for the period of 1998-2012 (Miranda-Filho et al., 2021). It showed, papillary thyroid cancer was the main contributor to overall thyroid cancer in all the studied countries. This histology type showed an increase in

all the countries with larger variability between the countries. In many Asian countries, this study showed an increase in papillary thyroid cancer and a decrease in anaplastic type. Similarly, various other studies also showed a same pattern (Thompson et al., 2011; Pham et al., 2021). They also identified the papillary type as the commonest among both genders and anaplastic as the least. Also, they identified an increase in the number of thyroid cancers with time.

The findings from our study are compatible with almost each of the above summarized studies. The papillary carcinoma has been the commonest type and the incidence of anaplastic has been the least as found in our study. But there was no fixed trend in any of the above said studies with regard to the different histological types or the number of total thyroid cases. There have been fluctuations in the number of annual cases in all the studies including our one. But the papillary type has been the predominant one as in ours. In our study, there was no single case of anaplastic type among the male population. This is completely different from other studies. This finding could be due to the limited number of samples or data available at Teaching Hospital Batticaloa or the study only was carried out at a single center. Further studies in this regard is necessary. But the prevalence of different histological types has been showing a larger variation between the countries (Miranda-Filho et al., 2021).

Differentiated thyroid carcinoma (DTC) includes papillary and follicular types and they are the commonest thyroid cancers. They have a better prognosis and a promising survival rate compared to medullary or anaplastic types. This study confirms that DTCs are the commonest types of thyroid histology predominant throughout the study period and prevalent among both genders. Even though there were on and off fluctuations in the distribution of these different histology types, in general medullary and the anaplastic carcinomas were the least. But they were identified time to time and they require proper management and follow-up. The different histology types didn't follow any trends among different genders. But the DTCs were the very commonest between 15-59 years and the anaplastic was prevalent in the older age above 60 years.

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Study on knowledge of immediate newborn care among midwifery-trained nurses in a tertiary care Teaching Hospital in Sri Lanka

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Abstract:

Introduction:
In its "National Guidelines for Newborn Care", the Ministry of Health Sri Lanka has incorporated ten essential steps in immediate newborn care. In order to improve the well-being of newborns, health staff, who are the first contact at delivery must follow these guidelines.

Objectives:
To assess the midwifery trained nurses' knowledge of "Ten steps of immediate newborn care" at Sri Jayewardenepura General Hospital (SJGH).

Method:
A descriptive cross-sectional study was carried out from 1st March 2019 to 31st May 2019 among midwifery-trained nurses at SJGH. Data was collected by pretested interviewer-administered questionnaire and analyzed with descriptive statistics. The association between the status of knowledge with the duration of service, duration since midwifery training, and the working unit was assessed with an odds ratio (OR) with its 95% confidence interval (CI).

Resuilts:
There were 60 midwifery-trained nurses and all participated in the study. According to the study; good knowledge, satisfactory knowledge,e, and poor knowledge were 30%, 60% and 10% respectively. 90% had either good or satisfactory knowledge. Results of our study showed that the place of work was a statistically significant predictor for knowledge of immediate newborn care at p=0.05 level.

Conclusion: Despite adequate knowledge of the nurses providing immediate newborn care, our study identified a knowledge gap in a few important steps of immediate newborn care.

Key words: Immediate newborn care, ten steps, delayed cord clamping, midwifery trained, Knowledge

Introduction

Successful adaption from intrauterine to extrauterine life is a challenge faced at birth by the newborn1. This transition and subsequent well-being of a baby should be understood by the primary health care personnel and facilitated around the time of birth by providing immediate newborn care[1,2] During this transition, the newborn goes through considerable physiological adaptations to survive in the new environment. Hence, it is crucial to facilitate skilled immediate newborn care at the time of delivery[2-6] Care at birth is of utmost importance in the prevention of birth complications and ensuring subsequent normal growth and development of a newborn[7].

The National Guidelines for Newborn Care, issued by the Ministry of Health, Sri Lanka, has incorporated ten important steps for immediate newborn care. These steps should be followed by the health care providers at all levels, to improve the quality of clinical care at birth[2]. Immediate newborn care protocol is a series of management steps that a newborn should receive at birth and it contains ten standardized effective procedural steps: 1) call out the time of birth, 2) dry the baby with a warm clean towel and wipe eyes, 3) assess the baby's breathing while drying, 4) practice the delayed cord clamping- clamp the umbilical cord at least 1 minute after the birth if the baby does not require resuscitation, 5) deliver baby on to mother's abdomen after clamping the cord, 6) cover mother and baby with a warm cloth, 7) put a cap on the baby's head, 8) allow the baby to remain between mother's breasts for skin to skin contact, 9) place an identity tag on baby, 10) encourage first breastfeed within one hour of birth[3,4,5,6]. All of the immediate newborn care interventions are simple to perform and use minimal resources[7]. Clear knowledge regarding these ten steps is crucial in delivering appropriate immediate newborn care[2]. Lack of knowledge may impede the provision of quality care[3,4]. Hence assessing the level of knowledge and identifying the gaps in knowledge is important to maintain correct practice by teaching and updating the health staff[8].

Objectives

General objective

To assess the overall knowledge regarding "essential newborn care immediately after birth" among midwifery-trained nursing officers of Sri Jayewardenepura General Hospital.

The specific objectives were to find the association between the aforesaid knowledge and other factors namely, duration in service, period since midwifery training,g and place of work.

Method

A descriptive cross-sectional study was conducted from March 2019 to May 2019.

All 60 midwifery-trained nurses at SJGH were included in the study.

Their knowledge of each of the ten steps of "immediate newborn care" was assessed by using a pretested interviewer-administered questionnaire which also included the duration of service (approximate number of years), the time length (years) since completion of midwifery training, and place of work. The questions were directly based on the ten steps of immediate newborn care listed in the National Maternal and Newborn Care Guidelines published by the Ministry of Health.

Data were collected by the principal investigator and the co-investigators.

One mark was awarded for every correct response to each pre-designed question related to immediate newborn care with a maximum score of 10. The total score was then graded according to the cumulative score below.

Good knowledge	= 9, 10
Satisfactory knowledge	= 7, 8
Poor knowledge	= 6 or less

Data were analyzed by using descriptive statistics and the latest version of the SPSS.

Ethical Consideration

Ethical approval was obtained from the Ethical Review Committee of SJGH and informed written consent was obtained from each nursing officer. All documents are kept confidential with access to the researchers only.

Resuilts

There were 60 midwifery-trained nursing officers in SJGH and all participated in the study. All the participants were female.

The duration in service, the period since completion of midwifery training and the place of work were as follows. (Table 1)

Table 1: General characteristics of the participants (N=60)

Characteristic	Number	Percentage
Duration of service (in years)		
<1	02	3.3
1 to <5	11	18.3
5 to <10	13	21.7
10 or more	34	56.7
Duration since completion of Midwifery training (in years)		
<1	11	18.3
1 to <5	11	18.3
5 to <10	20	33.3
10 or more	18	30.0
Place of work		
Labour room	19	31.7
Obstetric wards	34	56.7
Other units	07	11.7

The majority of the participants (56.7%) have work experience of more than 10 years and only 3.3% had less than one year of working experience. 18.3% of nurses had midwifery training within one year and a similar percentage one to five years before. One-third of the study population has had the training 5 – 10 year period before. The majority of the nurses (56.7%) were attached to obstetric wards and 31.7 % were attached to the labor unit.

The correct response to knowledge of each of the ten steps of immediate newborn care is as follows (Table 2):

Table 2:Total number of nurses who had correct knowledge of steps of immediate newborn care among study participants (N=60)

Step	Number	Percentage
Step 01-Indication of time of birth	60	100.0
Step 02-Drying of baby with a warm clean towel	57	95.0
Step 03-Assessment of baby's breathing while drying	58	96.7
Step 04- Delayed cord clamping	38	63.8
Step 05-Deliver baby onto mother's abdomen	04	6.7
Step 06-Coverring of mother and baby with a warm cloth	48	80.0
Step 07-Covering of baby's head	51	85.0
Step 08- Allowing of skin to skin contact	55	91.7
Step 09-Placing of an identity tag on babies	60	100.0
Step 10- Encouraging first breastfeeding within the first hour of birth	60	100.0

All nurses were aware of the importance of indicating the time of birth, placing an identity tag, and encouraging breastfeeding within the first hour of birth. More than 80% of the participants were aware of drying the baby with a warm towel, assessing of baby's breathing, covering both mother and baby with a warm cloth, covering of baby's head, and allowing skin-to-skin contact. However, only 63.8% were aware of delayed cord clamping. Knowledge of the value of delivering the baby onto the mother's abdomen was very minimum.

Each participant was given a score to assess overall knowledge as described above.

Table 3:Total score on overall knowledge

Score	Number	Percentage
06	02	3.3
07	11	18.3
08	25	41.7
09	17	28.3
10	05	8.3

As per the scores obtained by the participants: good knowledge, satisfactory knowledge, and poor knowledge were 30% (n=18), 60% (n=36), and 10% (n=6) respectively. 90% (n=54) had either good or satisfactory knowledge.

Table 4: Factors associated with the level of knowledge (N=60)

		Score out of Ten Steps of Immediate Newborn Care					Total
		6	7	8	9	10	
Place of Work	Labour Room	0	1	5	10	3	19
	Obstetric Wards	4	15	10	5	0	34
	Other	3	3	1	0	0	7
Total		7	19	16	15	3	60

Nearly one-third of nurses are working in the labor ward and 68.4% had overall good knowledge while 100% of them had good or satisfactory knowledge of immediate newborn care. The majority (56.7%) of the study population is attached to obstetric wards and 73.5 % have satisfactory knowledge of the ten steps of immediate newborn care. For the easiness of understanding, dependent variables were amalgamated and dichotomized as 5 years or more & less than 5 years for the duration of service, 5 years or more & less than 5 years for the duration since completion of midwifery training, labour room and obstetrics wards as obs units and rest of units as any other unit for the place of work.

However, the likelihood of having good knowledge was found to be high in a statistically significant manner among those who work at obstetric units i.e., labour room & obstetrics wards (OR=9.18, p=0.004) compared to those who work at other units. The associations between the status of knowledge with selected factors are shown in Table 5.

The association with the status of knowledge with above selected dependent variables is presented in the following table (Table 5)

Characteristic	Good or satisfactory Knowledge (n and %)	Poor Knowledge (n and %)	Total (n and %)	OR	95% CI OR	P value
Duration of service in years						
5 years or more	36 (76.59%)	11 (23.40%)	47 (100.0%)	0.59	0.11-3.10	0.71
<5 years	11 (84.61%)	02 (15.38%)	13 (100.0%)			
Duration since completion of midwifery training						
5 years or more	34 (89.47 %)	04 (10.53%)	38 (100.0%)	0.85	0.14-5.06	1.0
< 5 years	20 (90.90%)	02 (9.1%)	22 (100.0%)			
Place of work						
Obs unit (LR & Obs ward)	49 (92.45%)	04 (7.55%)	53 (100.0%)	9.18	1.50-56.19	0.004
Any other place	03 (42.85%)	04 (57.14%)	07 (100.0%)			

Discussion

Immediate newborn care is an important practice established to provide care and prevent complications around the time of delivery. Thus, adhering to the protocol would be a cost-effective method for reducing neonatal morbidity and thereby the health burden.

Adaptation to the new environment, survival, and well-being of a newborn is mainly determined by the care provided at birth.

In this study, we aimed to determine the level of nurses' knowledge regarding recommended steps of early newborn care. Our primary target of health workers was midwifery-trained nurses in SJGH. In our study, the majority of the nurses have adequate knowledge of the steps of immediate newborn care. Among the study participants, 90% knew seven or more steps of immediate newborn care. This is higher compared to the studies conducted in Sudan[1], Ethiopia[3,8] and Egypt[7]. A study done in Uganda by Ayiasi et al. revealed that 46.5% of the health care workers had adequate knowledge of immediate newborn care at birth. There was no statistical difference in knowledge between health workers who had served six years or longer in reference to health workers who had served five years or less ($p=0.836$)[9]. The discrepancy in the level of knowledge may be due to inadequate educational level, lack of training programs, lack of protocols and demonstrating the material in labor rooms, shortage of materials in labor units, and providing immediate newborn care by assistants or midwives in some of these countries.

When considering the individual steps of newborn care, the least known step was delivering the baby to the mother's abdomen, which accounted for 6.7%. More than half of the nurses (63.3%) knew about delayed cord clamping which is an important step in the prevention of anaemia in infancy. The majority of the nurses' knowledge on drying the baby with a warm clean towel, assessing the breathing while drying, covering mother and baby with a worm cloth, covering the baby's head, and allowing skin-to-skin contact was good.

Nurses in the labour room and obstetrics wards had good/satisfactory knowledge compared to those who are attached to other units at a statistically significant level.

The nurses with less service and less duration since the midwifery training had good/satisfactory knowledge compared to those who had more service and more duration since midwifery training, albeit these associations were not statistically significant at the level of $p=0.05$.

Conclusion

The findings of our study indicated that the majority of the midwifery-trained nurses in SJGH have adequate knowledge of the steps of immediate newborn care. Despite having good overall knowledge in general, the study population had poor knowledge of some steps of early newborn care. A knowledge gap was identified on delayed cord clamping and delivering the baby to the mother's abdomen. Only 63. 8% of them were aware of delayed cord clamping which is a very important step. The least proportion of the participants was aware of delivering the baby onto the mother's abdomen. According to our study, knowledge was comparatively good when the midwifery training was taken within 10 years and the work experience is more than a year. Generally, among the nurses who participated in our study, 96.7% had adequate knowledge of most of the steps of immediate newborn care.

Conflicts of Interest

The authors declare no conflicts of interest. The study was self-funded

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Review article

The diagnosis and management of spontaneous bacterial peritonitis

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Abstract:

Spontaneous bacterial peritonitis (SBP) is a bacterial infection of ascitic fluid in patients with decompensated cirrhosis. The infecting organisms are usually enteric gram-negatives which have translocated from the bowel. Most common symptoms of SBP are fever, abdominal pain, mental status changes, and ileus. It is also observed that SBP could present as hepatic encephalopathy without any other symptoms. Therefore, high index of suspicion should exist for SBP in patients with cirrhosis and ascites. Diagnostic abdominal paracentesis can be undertaken with minimal risk and should be performed in all patients admitted to the hospital, during times of worsening clinical appearance, or when gastrointestinal bleeding occurs. The ascitic fluid polymorphonuclear cell count is the most sensitive test in evaluating for infection. Cultures of the ascitic fluid are helpful in identifying the organism and are best performed at the bedside by simply collecting ascitic fluid into culture bottles. Distinguishing SBP from secondary bacterial peritonitis is essential because the conditions require different therapeutic strategies.

The standard treatment for SBP is prompt broad-spectrum antibiotic administration and should be tailored according to community-acquired SBP, healthcare associated or nosocomial SBP infections and local resistance profile. Albumin supplementation, especially in patients with renal impairment, is also beneficial. Prophylaxis should be limited to high-risk settings. Mortality rates in SBP have declined dramatically, largely due to earlier detection and improved therapy.

Key words: Peritonitis, Spontaneous bacterial peritonitis, Secondary bacterial peritonitis, Cirrhosis, Ascites

Introduction

Peritonitis is an inflammation of the abdominal serosal membrane, triggered by various pathologic stimuli and resulting in either infectious or sterile conditions1. Peritoneal infections are categorized into three types: primary, secondary, and tertiary. Primary peritonitis, commonly known as spontaneous bacterial peritonitis (SBP), typically occurs in patients with chronic liver disease. Secondary bacterial peritonitis results from peritoneal infections due to intra-abdominal lesions, such as perforation of the hollow viscus, bowel necrosis, or trauma causing penetrating infections including iatrogenic causes. Tertiary peritonitis is less common, typically arising after surgical interventions for secondary peritonitis and is closely linked to a systemic inflammatory response[1, 2]. Normally the peritoneal fluid amount is less than 50 mL, and consists of protein content of less than 30 g/L (mainly albumin), and contains small numbers of desquamated mesothelial cells and various numbers and morphologies of migrating immune cells (reference range is < 300 cells/ mm^3, predominantly of mononuclear morphology)[2].

Cirrhosis is a leading cause of death worldwide, appearing among the first 10 major causes of death in many countries[3]. Cirrhotic patients have an altered

defence mechanism against the microbes associated with reduced bacterial clearance4. This immune defect facilitates bacterial translocation induced by increased intestinal permeability and gut bacterial overgrowth5. Therefore, bacterial infection is either present on admission or develops during hospitalization in about 30% of patients with cirrhosis, and the most common form of these infections is SBP[6].

SBP is defined as bacterial infection of the ascitic fluid in the absence of a proven or suspected intra-abdominal source of infection. Despite improvement in treatments, SBP remains associated with the mortality as high as 46%, as well as high recurrence rates after initial infection7. It is a common and frequently fatal bacterial infection of ascites occurring in patients with cirrhosis who have diverse symptomatology including fever, abdominal pain, mental status changes, ileus or even hepatic encephalopathy without any other symptoms. The diagnosis is distinct from secondary bacterial peritonitis and hence is made in the absence of an intra-abdominal source of infection or inflammatory process[2].

The diagnosis of SBP is confirmed by an ascitic fluid absolute polymorphonuclear (PMN) count of more than 250 cells/mm3 (sensitivity of 93% and specificity of 94%). Due to the widely variable presentations of SBP, including a high number of asymptomatic patients, diagnosis can be challenging. Clinicians must therefore maintain a low threshold for prompt diagnosis. Patients with cirrhosis and ascites hospitalized for any reason should have a diagnostic paracentesis performed during hospitalization, even in the absence of overt signs of infection. Ascitic fluid should also be simultaneously sent for culture, with direct inoculation of ascitic fluid into culture bottles at the bedside[8, 9,10]. SBP developing in the setting of ascites from causes other than cirrhosis is rare, but can occur in cardiac ascites, nephrogenic ascites, and ascites associated with fulminant hepatic failure, and alcoholic and viral hepatitis[11, 12, 13, 14]. Malignant ascites is even less frequently complicated by SBP[15].

Five variants of ascitic fluid infection are described, based on the PMN count in the ascetic fluid, culture results, and method of entry of the organism into the fluid. SBP is the prototype and is most common. It is defined as a PMN count ≥250 cells/mm3 in the presence of a single organism on culture. Monomicrobial nonneutrocytic bacterascites (MNB) occurs when the PMN count is less than 250 cells/mm3, but growth of a single organism is detected on culture. Culture-negative neutrocytic ascites (CNNA) is defined as an elevated ascitic fluid PMN count (≥250 cells/mm3) in the absence of culture growth, obtained prior to the administration of antibiotics. Secondary bacterial peritonitis is distinct from the previous subtypes in that the source of the organism is a surgically treatable process such as a perforated viscus or a contained intra-abdominal abscess. In these cases, the PMN count is ≥250 cells/mm3 and the culture results are usually polymicrobial. Polymicrobial bacterascites presents with a PMN count <250 cells/mm3, and as the name suggests, polymicrobial growth on culture[14, 15, 16]. The incidence of SBP ranges from 10% to 30% and mortality from 10% to 46% in hospitalised patients[17, 18, 19]. Clinical acumen, prompt diagnosis and appropriate treatment remain the most important tools for physicians when caring for patients who acquire SBP in various clinical settings.

Bacteriology

SBP is typically a monomicrobial infection, Escherichia coli, gram-positive cocci (streptococci and enterococci) and Klebsiella pneumoniae are being the most frequent cultured isolates. Despite the "routine" use of third generation cephalosporins (cefotaxime, for instance) in the suspicion of SBP, it is now essential to consider the role of MDR strains in patients with cirrhosis. Extended-spectrum beta-lactamase (ESBL) producing enterobacteria are the most frequent MDR strains in patients with cirrhosis who are infected. Infections with these bacteria, isolated in more than 30% of cases of SBP, are associated with higher mortality than infections with less resistant bacteria[20].

The emergence of extended-spectrum beta-lactamase (ESBL) in gram negative bacteria (GNB), methicillin-resistant Staphylococcus aureus (MRSA), flouroquinolone-resistant (QR) GNB, vancomycin-resistant Enterococcus and other resistant microorganisms have also changed prior perceptions about SBP bacteriology and its treatment[21, 22].

The pathogens normally detected in secondary peritonitis are gram-negative organisms such as E. coli, and anaerobes. Other pathogens may be pseudomonas aeruginosa, Enterobacter, and Enterococci spp.

Diagnosis

Spontaneous bacterial peritonitis (SBP) should be suspected in patients with cirrhosis who develop signs or symptoms, such as fever (69%), abdominal pain (59%), altered mental status (54%), abdominal tenderness (49%), diarrhea (32%), ileus (30%), hypotension/shock (21%), or hypothermia (17%). However, 10% of cases show no signs or symptoms, partly because a large volume of ascites prevents contact of the visceral and parietal peritoneal surfaces to elicit the spinal reflux that cause abdominal rigidity[16].

Laboratory evaluation (not including ascitic fluid analysis) is non-specific. There may be a subtle elevation in the peripheral leukocyte count, an increase in blood urea nitrogen and serum creatinine, or an unexplained metabolic acidosis2, 24, 25. Unfortunately, the history, physical examination, and serum laboratory testing are not useful in distinguishing SBP, CNNA, and secondary bacterial peritonitis[23, 24, 26].

SBP is not a clinical diagnosis, and it cannot be made without ascitic fluid analysis. Interpreting ascitic fluid results namely cell count and differential to calculate the polymorphonuclear (PMN) count, which is the result of multiplying the total ascitic fluid white blood cell count by the neutrophil count, is paramount. A PMN count greater than 250 cells per mm3 provides a preliminary diagnosis, and although culture results are often negative, historically, a positive ascitic fluid culture confirms the diagnosis of SBP[27].

Secondary bacterial peritonitis should be suspected if the ascites PMN count is ≥250 cells/mm3 and two of the following three ascitic fluid values are met: (1) glucose < 50 mg/dl, (2) total protein > 1 g/dl, and (3) lactate dehydrogenase greater than the upper limit of normal for serum[28]. Gut perforation can be predicted with 100% sensitivity (but only 45% specifi city) using these criteria[28]. Nonetheless, patients who fulfill two of these criteria must undergo immediate flat and upright abdominal Xrays, and if negative, water-soluble contrast studies of the gastrointestinal tract or abdominal computed tomography. The finding of more than one organism on Gram's stain or culture of ascitic fluid should prompt a similar urgent evaluation for perforation[29]. It should be kept in mind that radiological imaging prompts the early diagnosis and management of secondary bacterial peritonitis.

Treatment

The choice of empirical antibiotic therapy for SBP should be based on severity and source of infection, and on local epidemiological data on bacterial resistance. Generally, third-generation cephalosporins remain the first-line therapy for community-acquired infections (usually ceftriaxone or cefotaxime 2 g IV every 8 hours). Empirical treatment of healthcare-associated and nosocomial infections should be guided according to local microbiological profiles[30]. The effectiveness of antibiotic treatment against SBP should be assessed by an analysis of ascites after 48 hours of therapy. Carbapenems associated or not with glycopeptides are the mainstream choice for healthcare-associated and nosocomial infections. Alternatives, such as piperacillin-tazobactam, could be considered in settings with low prevalence of infections associated with MDR bacteria. Usual duration of antibiotics is 10 -14 days[30, 31, 32].

Acute kidney injury occurs in approximately one third of patients diagnosed with SBP and it is a strong predictor of mortality during hospitalization. Plasma volume expansion with intravenous albumin decreases renal impairment and mortality in patients with cirrhosis and SBP. A randomized controlled trial at the Hospital Clinic of Barcelona done in 1999 showed that prophylactic albumin infusion (1.5 g/kg on day 1 and 1 g/kg on day 3) was associated with a lower prevalence of renal impairment and mortality than antibiotic therapy alone[33].

Antibiotics most commonly used for secondary bacterial peritonitis are carbapenems and newer quinolones or combinations, such as antianaerobes plus aminoglycoside, or antianaerobes plus third generation cephalosporins or chinolones, or clindamycin plus monobactam. Community-acquired infections of mild to moderate severity can be treated with Cefoxitin, Cefotetan, Cefmetazole, Ticarcillin-clavulanic acid. Usually the antibiotics are given for 5–7 days and until temperature and white blood cell count are within normal limits[2]. In addition to the antibiotics, surgical intervention plays an important role in the management of secondary bacterial peritonitis.

Prophylaxis

Regarding primary prophylaxis of SBP, two situations must be considered. The first refers to patients with cirrhosis (with or without ascites) with bleeding from any source passing through the digestive tract. Such

patients have higher risk of bacterial translocation and infections and should undergo prophylaxis for 7 days with norfloxacin 400 mg orally twice daily34. A randomized controlled trial has demonstrated that patients who meet at least two of four severity criteria (presence of ascites, hepatic encephalopathy, severe malnutrition and/or bilirubin levels >3 mg/dL) develop fewer infections when prophylaxis with intravenous ceftriaxone 1 g/day instead of norfloxacin35. The second indication for primary prophylaxis concerns individuals who have ascetic protein levels under 1.5 g/dL. The use of norfloxacin 400 mg/day orally was evaluated in patients with low total protein content in ascitic fluid who presented signs of advanced hepatic failure (Child–Pugh ≥9 and bilirubin levels ≥3 mg/dL), or some degree of renal impairment (creatinine levels ≥1.2 mg/dL, or blood urea nitrogen ≥25 mg/dL, or serum sodium levels ≤130 mEq/L)[36].

Secondary prophylaxis of SBP is recommended for patients with prior episode of confirmed SBP. Antibiotic prophylaxis should be started after the completion of antibiotic therapy for SBP and should be continued until resolution of ascites, liver transplantation, or death. Oral norfloxacin 400 mg/day or ciprofloxacin 750 mg weekly or five doses of double-strength trimethoprim-sulfamethoxazole per week (Monday to Friday) is recommended. This is justified by a rate of SBP recurrence of approximately 40 to 70% and mortality rate of 50 to 70% in one year[1, 34].

Conclusion

Spontaneous bacterial peritonitis (SBP) is a severe complication in cirrhosis patients with ascites. Clinical awareness, prompt diagnosis by exclusion of secondary bacterial peritonitis, and immediate treatment are necessary to reduce mortality and morbidity in this patient group. However, the emergence of multidrug-resistant (MDR) microorganisms has changed our understanding of SBP bacteriology and treatment. Antibiotic therapy specific to either community-acquired or nosocomial/healthcare-acquired SBP is ideal, while liver transplantation remains the definitive treatment following SBP. High-risk patients must be treated for infections in a more aggressive way. Infections caused by MDR bacteria should be a current concern, and new antibiotic strategies are needed for this special population. Individualized antibiotic treatment based on local epidemiology is the key for success, not neglecting the urge to preserve renal function of these complex patients.

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Featured articles

Physical activity in preventing Atherosclerotic Cardiovascular Disease (ASCVD) Risk: A short perspective.

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Abstract:

Atherosclerotic Cardiovascular Disease (ASCVD) is a leading cause of mortality and morbidity in Sri Lanka. Physical inactivity is a modifiable risk factor strongly associated with the development and progression of ASCVD. This article provides an outline on the importance of physical activity in reducing ASCVD risk. It explores the physiological mechanisms through which physical activity exerts its protective effects and examines the possible ways and means by which cardiovascular health can be promoted by increased physical activity.

Keywords:

Atherosclerotic Cardiovascular Disease (ASCVD), Physical Activity, Exercise, Risk Reduction, Health Promotion.

Introduction

Atherosclerotic Cardiovascular Disease (ASCVD) encompasses conditions, including coronary artery disease, stroke, and peripheral arterial disease. While multiple risk factors, including diabetes mellitus, hypertension, and dyslipidemia, contribute to ASCVD, physical inactivity, dietary considerations and smoking stand out as crucial modifiable determinants.

This article aims to look at the importance of physical activity in mitigating ASCVD risk and to provide insights into its clinical and public health implications.

Pathophysiological mechanisms

The initiating pathological process involved in atherosclerotic disease is dysfunction of the endothelium[1]. Dysfunctional endothelium will allow the subintimal passage of atherogenic lipid particles like LDL. This thereafter initiates an inflammatory reaction resulting in progressive plaque growth. Exercise is known to enhance endothelial function, reduce inflammation, and promote vasodilation thereby slowing the formation of an atheromatous plaque[2,4].

Additionally, physical activity plays a crucial role in maintaining healthy body weight, controlling blood pressure, and enhancing insulin sensitivity, all of which contribute to a favorable cardiovascular risk profile[3,4].

Regular exercise improves lipid profiles by raising high-density lipoprotein cholesterol (HDL-C) levels and lowering low-density lipoprotein cholesterol (LDL-C) levels, thus attenuating atherosclerosis progression[3].

Health recommendations

Incorporating physical activity into clinical practice and public health initiatives is essential for reducing the burden of ASCVD[5,6]. It is unfortunate to note that in our country physical activity is shunned upon by society. Schools fail to provide the space and opportunity for physical activities and play. After school the tuition culture does not allow for play and exercise. The widespread use of devices increases the time children and adults' spend sitting. Physical activity has shown to clearly reduce the risk of cardiovascular disease with a magnitude of risk

reduction comparable to that of not smoking. This has let to the phrase "Sitting is the new smoking".

Atherosclerotic disease commences from childhood. The first macroscopic feature of an atherosclerotic plaque is the fatty streak which is usually evident by the teen years.

Social institutions, policymakers, and healthcare systems must prioritize efforts to promote regular physical activity at both individual and population levels to mitigate the burden of ASCVD.

Behavioral interventions, including counseling, goal setting, and monitoring, can enhance adherence to enhanced activity goals and facilitate long-term behavior change. Comprehensive strategies including environmental modifications, policy initiatives, and school and community-based programs aimed towards promoting active living and creating supportive environments for physical activity participation.

Encouraging active participation in traditional and performing arts is an engaging and creative method to promote ASCVD risk reduction[7]. Most art forms involve physical movement and exertion, such as dance, drama, martial arts, and traditional crafts like pottery or woodworking. Regular participation in these activities will help significantly to promote cardiovascular fitness.

Conclusion

ASCVD is preventable! It's imperative that we as a community recognize the importance of preventing this disease and take the appropriate steps today to prevent a future disaster.

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Case Report

Adenocarcinoma at the ligament of Treitz - A rare presentation

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Introduction

Primary small bowel neoplasms at the ligament of Treitz are extremely rare and require advanced surgical techniques for extirpation. Management of such a rare tumour is a unique challenge for surgeons due to several reasons, including the diagnostic difficulty with insidious onset and delayed presentation leading to increased growth of the neoplasm by the time of diagnosis, the partial retroperitoneal location of the tumour with nearness to critical anatomical structures like pancreas and superior mesenteric pedicle, difficulty in surgical planning with small bowel resection and reestablishment of gastrointestinal continuity. We present an unusual case of a primary small bowel adenocarcinoma at the Ligament of Treitz, requiring segmental resection from third part of the duodenum to proximal jejunum.

Case report

A 61-year-old farmer presented with a history of melena for 6 months. He was diagnosed with rectal adenocarcinoma 5 years ago and underwent APR in 2016. He was referred to us for follow-up colonoscopy and upper gastrointestinal endoscopy (UGIE) for the investigation of melena. We found a large malignant looking polypoidal mass in the third part of the duodenum during the UGIE and multiple biopsies were taken. Colonoscopy was normal and no polyps were found in entire colon. Histology from the biopsy revealed a moderately differentiated adenocarcinoma. Contrast enhanced CT scan showed a heterogeneously enhancing soft tissue density mass lesion measuring 4.4cm×7.2cm in the third part of the duodenum favoring a malignant lesion with evidence of perilesional fat infiltration. There was no CT evidence of pancreatic or other bowel loop infiltration.

The transverse colon and mesocolon appeared normal. The lesion displaced the superior mesenteric vessels anteriorly without any vascular infiltration. Posteriorly the aorta appeared normal. There were multiple enlarged lymph nodes in the perilesional and superior mesenteric group. No liver or lung secondaries.

The patient was evaluated for co- morbidities and optimized as required. His weight was 35 kg with a BMI of 14.8kg/ m2. Nutrition referral was made considering his very low BMI and supplementations were started. On admission Hemoglobin was 7.8g/ dl and 3units of RCC were transfused preoperatively. Surgical procedure was carried out under general anesthesia with invasive monitoring and epidural analgesia.

An upper abdominal midline incision was made. Hepatic flexure was mobilized and full duodenal kocherization made. Tumor was identified at the ligament of treitz involving third part of the duodenum up to proximal jejunum. The neoplasm (Figure 01) was circumferential and an almost obstructing mass. It was a large tumor (60×65×20mm) infiltrating the third and fourth parts of the duodenum and proximal jejunum. It is very closely related to the aorta posteriorly and separated from it with only a very flimsy layer of loose areolar tissue. The superior mesenteric artery was pushed anteriorly by the tumour mass.

The surrounding peritumoral desmoplastic reactions/ adhesions were carefully dissected, allowing the tumour to be gently released. Superior mesenteric vascular pedicle was carefully separated from the tumour and lifted off from the posteriorly placed

aorta. At this point it was evident that it was possible to achieve an adequate proximal resection margin without committing for whipples' surgery. Duodenum was divided at the junction of second and third part of the duodenum with a 3 cm macroscopic proximal margin and assured that enough length is available from sphincter of oddi for anastomosis. Proximal jejunum was divided with a linear stapling device with an adequate distal resection margin and the stapler margin was oversewed. The small bowel tumour was resected (from third part of the duodenum up to proximal jejunum) en bloc with the corresponding jejunal mesentery for wide margins and nodal clearance (Figure 02). A hand sewn end to side anastomosis was made in two layers with 3.0 PDS sutures. The distal cut end of the duodenum anastomosed to the anti-mesenteric border of the free limb of proximal jejunum (Duodenojejunostomy). Distal enterotomy made in the jejunum and drain is inserted through it and brought in to the second part of the duodenum and taken out through the anterior abdominal wall as in duodenal exteriorisation. A separate feeding jejunostomy created distal to the duodenal exteriorisation. The operative time was 6 hours and intraoperative blood loss is 350 ml. Post operative period was uneventful.

The histopathology report stated that sectioning through the duodenum and jejunum showed a moderately differentiated adenocarcinoma with focal mucinous differentiation. The tumour infiltrated the full thickness of the bowel wall, but the circumferential margin was clear (0.5mm). Vascular emboli were not seen and there were ten lymph nodes, all free of metastatic deposits. Both resection margins were clear. Immunostain findings stated as CK 7 - positive with strong cytoplasmic staining in tumour cells and CK 20 negative.

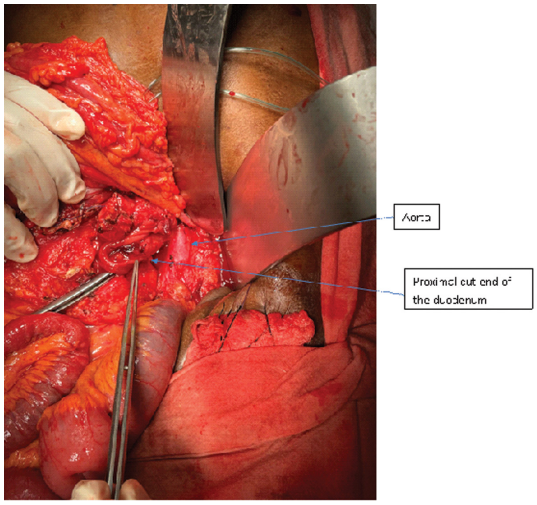

Figure 01

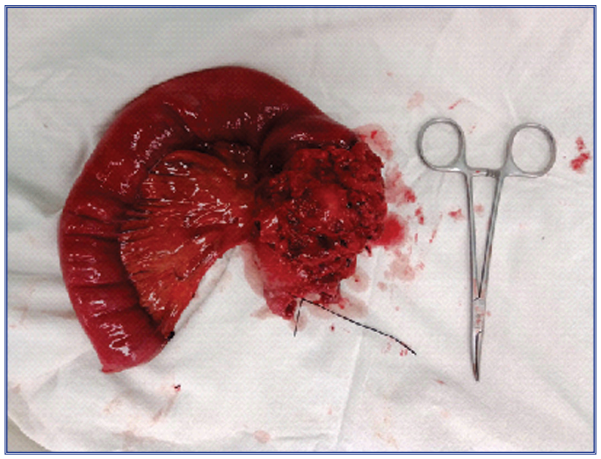

Figure 02

Discussion

Small bowel is comprised 80% of the gastrointestinal tract but small bowel carcinomas are comparatively rare (<1% of all gastrointestinal malignancies). Small bowel cancers are more common in men than women and mean age at presentation is 67 years [1].

The risk factors for small bowel cancers include alcohol consumption, ingestion of smoked foods, salt-cured foods, red meats, and refined sugars[2]. Majority of small bowel adenocarcinomas are arising from adenomas in the intestinal mucosa. Therefore adenoma—carcinoma sequence which is well described in the large bowel appears to be recapitulated to some extent in the small bowel. However, the exact sequence of genetic changes in the small bowel mucosa has not been well elucidated. Small bowel primary tumours are more frequent in hereditary nonpolyposis colorectal cancer (HNPCC) and familial adenomatous polyposis (FAP) family members[3]. Majority of the Small bowel adenocarcinomas arises in the duodenum, then decrease in incidence from jejunum to ileum [4] The rarity of the incidence of duodenal carcinomas make it is a challenging entity to manage. Extreme rarity of the adenocarcinoma at ligament of trietz also made the true incidence of adenocarcinoma is unknown. Nevertheless, duodenal adenocarcinomas constitute about 0.3 to 0.4 % of all GIT cancers. The distribution of small bowel tumors varies between studies but was similar to the findings in this study with 25% of the tumors in the duodenum, 37% in the jejunum, and 38% in the ileum[5] Several explanations have been proposed to account for this discrepancy. Reasons include the liquid nature of the intestinal contents, which may be less irritating to the mucosa, the rapid transit time in the

small bowel that reduces the exposure to carcinogens, a decreased bacterial population to produce carcinogens, the increased lymphoid tissue, an alkaline pH, and the presence of the enzyme benzyprene hydroxylase, which helps to detoxify potential carcinogens. The explanation for the infrequent finding of small bowel primary tumors is most likely multifactorial and encompasses all the above theories[5].

The duodenal adenocarcinoma is usually presents in the 6th and 7th decades. The possible histology from small bowel masses are adenocarcinoma, carcinoid and lymphomas. The commonest site at which adenocarcinomas arises in the small bowel is duodenum. A study done by Tocchi et al with 129 patients who was diagnosed to have primary small bowel cancers have found that 33% were adenocarcinomas, 29% were carcinoids and 19% were lymphomas [6]. About 50 % of all adenocarcinomas occur in the duodenum, nearly 20% in jejunum and a little over 10% in ileum and 14% occur in unspecified sites according to the national cancer data base in United States[7]. The majority[2/3] of duodenal adenocarcinomas arises at the periampullary region. The duodenal adenocarcinomas are associated with adenomatous polyposis coli, Gardners and Turcots syndrome, Crohns disease, Coeliac disease, Lynch syndrome, immunosuppression. The patients usually present with vague symptoms like intermittent pain due to partial intestinal obstruction, manifestations of upper gastrointestinal bleeding like melena or anaemic symptoms. Some may also present with anorexia and weight loss. However, the extreme rarity and vagueness of symptoms makes it difficult to diagnose these tumours a early stage.

The diagnosis of malignancies beyond the normal reach of upper gastrointestinal endoscope is a challenge. Surgeons and gastroenterologists use several methods to visualise and obtain biopsies from these tumours. There are no specific methods to diagnose these tumours in an early stage. Most of the cases require special investigations for diagnosis. Barium contrast has a diagnostic accuracy of 83% [6, 7]. Enteroclysis was considered as the gold standard for the investigation of small bowel pathologies. However, it is largely replaced by capsular endoscopy and double balloon enteroscopy (DBE). The advantage of double barrel endoscopy is its' ability to obtain biopsies. It was described by Yamamoto et al l in 2001[8]. Other available methods are Enteroscopy by the "push" method using the paediatric colonoscope or "sonde" enteroscopy.

In general tumours at first and second parts of the duodenum are treated by Whipples' procedure. From third part of the duodenum to proximal illeal tumours can be treated by segmental resection with lymph node clearance. Distal ileal tumours needed to be treated with right hemicolectomy. Tumours at the ligament of treitz is treated by duodenojejunal segmentectomy and duodenojejunal anastomosis.

Adjuvant chemotherapy is widely practising in small bowel cancers even though some studies showed that adjuvant treatment after complete resection has not shown reduction in recurrence [9]

The small bowel cancers has relatively a bad prognosis with an overall 5 year survival of 17- 25% [7] and median survival of 19.7 months[6].Bad prognostic features are large tumor size, transmural invasion, and moderate to poor tumour grade, nodal metastases, positive margins and tumour staging. Lymph node positivity is one of the most important prognostic indicators and a wide lymphadenectomy should be routinely performed. In one study done in 101 patients with duodenal adenocarcinoma, the three and five-year survival rates of patients with negative nodes were 73% and 68%, respectively, compared with 35% and 22% in patients with nodal metastases.[10] Although data are limited guiding adjuvant therapy options, oxaliplatin-based chemotherapy is typically offered to high-risk patients, such as those with positive lymph nodes. In some series, adjuvant radiation is associated with improved local control but no difference in overall survival[11] Prognosis is worse in duodenal malignancies. It is mandatory to follow up, these patients closely as there is a high possibility of developing another abdominal carcinoma. Majority of these recurrences are from synchronous polyps that are missed during the initial assessment specially in the duodenum or jejunum. Therefore, it is advisable to assess the upper gastrointestinal tract including the initial part of the jejunum, preoperatively or intraoperatively by way of endoscopy to prevent early recurrence.

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A case report of bilateral above-knee amputation in a treatment-defaulted patient with Rheumatoid arthritis

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Key words: Acute compartment syndrome, Rheumatoid arthritis, Rheumatoid vasculitis, symmetrical sensorimotor polyneuropathy, Bilateral Above-Knee Amputation

Introduction:

Compartment syndrome (CS) of the leg occurs due to raised pressure in an osseofascial compartment or a reduction in delta pressure (difference between diastolic blood pressure and compartment pressure) to a level that compromises tissue perfusion. This could rarely occur due to external compression by tightly applied casts and splints, tight dressings, anti-shock garments, or intraoperative positioning such as lithotomy or lateral positions[1]. CS due to tightly applied casts can be diagnosed early with proper post-procedure monitoring for pain out of proportion. Peripheral polyneuropathy can mask these early symptoms and may lead to a delayed diagnosis of CS.

Compressive or non-compressive peripheral neuropathies can occur as an extra-articular manifestation of Rheumatoid arthritis (RA). Among various forms of non-compressive neuropathies, combined sensorimotor polyneuropathy is rare, and it is usually due to ischaemic neuropathy caused by Rheumatoid vasculitis (RV)[2]. This case report emphasizes the increased vulnerability to CS in patients with RA with possible secondary vasculitis.

Case Presentation

A 36-year-old woman, a known patient with methotrexate-defaulted RA, experienced pain in both legs and feet for 1 month. She followed a native treatment with bilateral leg cast applied with varying herbal ingredients for the following month. She has noticed weakness and numbness in bilateral lower limb and patchy blackish discolouration in bilateral midleg and left toes for 4 days. Thus she stopped the native treatment.

One week later, she presented to the surgical ward with fever, shortness of breath, and confusion for 3 days, with a background history of worsening weakness, complete sensory loss, and extensive blackish discoloration of the same region. Furthermore, she has noticed mild numbness and weakness in bilateral hand for the last month.

Examination revealed the systemic features of septic shock, with wet gangrene of legs resembling the areas covered by native cast: below knee to ankle level. There was dry gangrene in the left forefoot. Right foot was dusky and cold. There was complete sensory loss and paralysis in bilateral leg and foot. Bilateral popliteal and distal pulses were absent, and all other pulses were felt. Oxygen saturation was not detected at all toes by pulse oximetry, even after correcting the hypotension.

There was global numbness and weakness in the bilateral upper limb predominantly in hands (power was scaled as 3 out of 5). Both hands were cold but not discoloured. Bilateral radial and ulnar pulses were felt but oxygen saturation was not detected in left little finger.

She was resuscitated and treated with bilateral 'Above-Knee Amputation' as a life-saving measure after intraoperative confirmation of extensive necrosis of muscles in all four compartments of leg. She was referred to a rheumatology unit for rehabilitation and re-evaluation in view of possible secondary vasculitis due to neglected RA.

Discussion

Native casts are applied in a considerable scale in Sri Lanka without proper regulatory measures or licenses. But there are hardly any reported cases of CS due to tight casts leading to limb loss in the literature because of severe pain acting as a protective factor in patients with normal neurological functions. The most reliable early sign of CS is pain on passive stretching of the muscles. These initial symptoms and signs will be masked by pre-existing peripheral polyneuropathy.

The clinical presentation of this patient strongly suggests symmetrical sensorimotor polyneuropathy of both upper and lower extremities. Combined sensorimotor polyneuropathy is rare in RA[2]. It is usually due to ischemic neuropathy (vasculitis of the vaso-nervorum) caused by RV[2]. There is no confirmatory laboratory test for RV[3]. It typically occurs in patients with long-standing severe RA[3].

At present, the annual incidence of RV is less than 1% in patients with RA[3]. An autopsy series of patients with RA found evidence of RV in 25-31% of subjects although one report was from 1954[4]. Similarly, in the pre-biologic era, distal sensory neuropathy and mixed sensorimotor polyneuropathy were reported in 1 to 18 percent of patients with early RA[5]. Therefore, a high level of clinical suspicion of RV is beneficial in patients with treatment-defaulted RA.

Conclusion

Early diagnosis of compartment syndrome is a challenge in patients with peripheral polyneuropathy. Despite the young age, routine distal neurovascular assessment before casting or application of hosieries prevents major disabilities or limb loss. Rheumatoid vasculitis should not be overlooked by surgeons when treating patients with RA.

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Severe Neutropenic Sepsis with Shock in a High-Grade B Cell Lymphoma: An Oncological emergency.

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Abstract:

Neutropenic sepsis is a common presentation among the patients having various carcinomas and those who undergo chemotherapy. Late Presentation of patients with septic shock with absolute neutropenia with a high severity is very challenging to manage in an Emergency set up. Acting in a short span of time recognizing the problems and complications and addressing them appropriately is the whole mark of management which would result in the better prognosis of the patient. Here we present a case of a neutropenic septic shock and expect to review the management deficits and protocols available in the literature and to propose few recommendations for better outcome of similar patients in the future. Here we present a case of a a 55 years old male, with a history of high grade B Cell Lymphoma underwent chemotherapy with recent admission to hospital with Lower respiratory tract infection treated inward for 1 week and discharged 10 days back, presented to the Emergency Department (ED), with severe dyspnea and shock. Initial ABCDE assessment was done and patient was managed as severe neutropenic septic shock. Basic Investigations in brief, showed Absolute Neutropenia, Severe Lactic Acidemia, Deteriorating Renal Function, Elevated liver enzymes and Left Lower lobar interstitial shadowing. Despite the vigorous treatment with every possible option (even in a resource poor setting), Patient deteriorated and within 1 hour of admission, patient passed away.

Here in we aspire to discuss a case with Late Presentation of Neutropenic septic shock with Multi organ dysfunction resulted in death at the ED, to evaluate the causative factors, possible enhancements in the current management plan that patient underwent, for better future outcome in similar patients.

Keywords:

Septic Shock, Neutropenia, Multi Organ Dysfunction.

Background

Neutropenic sepsis syndromes are far profuse among patients with cancer who are receiving intensive chemo therapy[1]. Early identification of sepsis and time critical treatment with appropriate antibiotics is the mainstay of treatment. In the case we present, there is a delay in the presentation to the health care setting and quickly deteriorating general condition of the patient and we would like revisit the causes and suggest few enhancements in the follow up and management of similar patients.

As in this case; Fever represents the major indicator and could be the only sign of infection in neutropenic cancer patients. [2,3]When the similar patients is having fever, they should be advised to seek medical care as sooner as possible for a better outcome, also the clinicians should be very cautious as to identify and treat for sepsis according to the surviving sepsis guidelines. In such a case the 1 hour bundle should be initiated and completed within 30 minutes for a better outcome. Neutropenia, resulting from chemotherapy is known to be the commonest risk factor for severe infections in hematological malignancies[3]

Neutropenia with absolute neutrophil count (ANC) less than 1.5 × 10(9)/l is a common hematological finding in such patients , and severe neutropenia is defined as ANC less than 0.5 × 10(9)/l and severe neutropenia is a well known risk factor for susceptibility to multiple fungal and bacterial infections. [4]The patient we present

had the ANC of 0.02 × 10(9)/l and had been severely neutropenic on presentation despite full blown sepsis in which we expect a little neutrophil rise. The patient had underwent 3 cycles of cytotoxic chemotherapy and last cycle was completed 1 month back and patient had a recent a inward admission and managed as lower respiratory tract infection. During the height of the fever in the last admission, the patient had a neutrophil count of 2.5 × 10(9)/l and patient was managed with IV Meropenam and Clarithromycin for 7 days empirically as the cultures were negative and patient was discharged 10 days back without proper post treatment evaluation full blood Count and proper advices about the consequences.

The Granulocyte Colony Stimulating Factor (G-CSF) must have been considered at that time by the oncology and hematology team as the patient was on the verge of developing neutropenia with possible infection, myelosupression by chemotherapy as well as the antibiotics that were used in the ward. Patients with severe chronic neutropenia known to acquire positive effects from treatment with granulocyte colony stimulating factor (G-CSF) [4]With the hospital admission patient might have contracted a hospital acquired infection (HAI) which could have been the causative organism for the presentation. Hospital acquired infections (HAI) are common adverse events in the developed world and remain a real challenge to address specially in a neutropenic patient in a resource poor setting like ours[5]. Before discharging the high risk patients its wise not to discharge as partially treated patients with residual infection. [6]In this case we noted poor awareness among the patients, late in identification of the neutropenic sepsis by the clinicians, poor record keeping by oncology departments as not to reveal the patient specific details due to the privacy concerns.

Case Presentation

Mr Kumarasena, 55 years old gentleman who is a farmer, diagnosed patient with malignancy underwent chemotherapy brought to the ED by 1990 with severe shortness of breath with documented pulse oximetry reading Spo2 of 60% on room air. He is a known patient with high grade B Cell Lymphoma diagnosed 6 months following Right sided Inguinal lymph node excision biopsy and had underwent 3 cycles of chemotherapy (ABVD Therapy); Adriamycin, Bleomycin, Vinblastine and Dacarbazine) and Last cycle completed 1 month back. He had recent hospital admission 2 weeks back in which he was managed as possible uncomplicated lower respiratory tract infection with empirical antibiotics of IV meropenam and Clarithromycin with blood culture negativity. In the admission he had neutrophil count of 2.5 × 10(9)/l and discharged after 7 days of antibiotics and patient was asked to be reviewed in 2 weeks with repeat FBC.

While presentation to the ED; patient had on and off

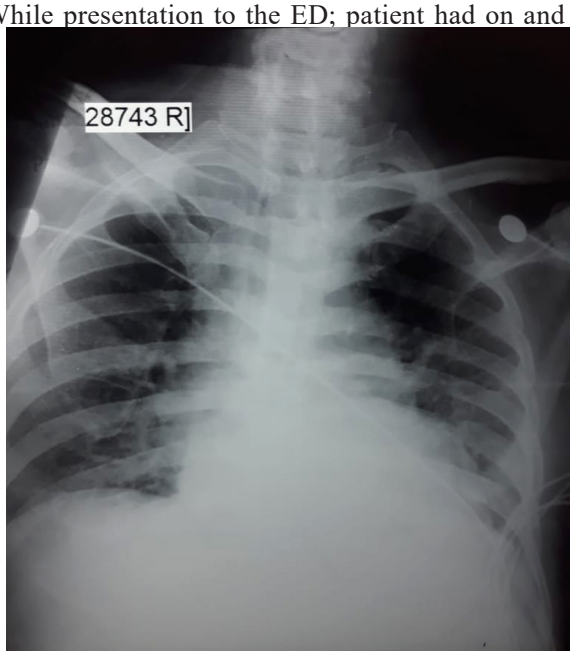

Figure 1

low grade fever with productive cough and worsening of Shortness of breath over 3 days duration which worsened on the morning of the presentation. Patient didn't seek proper medical care as he was not aware of the gravity. His past medical and surgical history is otherwise unremarkable. On examination patient was cachectic, ill looking, severely dyspnoeic, pale, mildly febrile and confused. Patient was assessed and Airway was patent as the patient was talking, The breathing was labored type, tachypnoeic with a rate of 30/min with SpO2 of 60% on room air, bilateral breathing sounds heart with Bilateral lower lobar coarse crepitations with prominent left side findings. He was tachycardic with low volume regular pulse with a BP of 70/40 mmHg and GCS was [14].

With the basic assessment, Patient was started on High Flow Oxygen via Non Re breathing Mask with 100% oxygen with 15l/min rate and Spo2 picked up to 94%, After Taking Blood for Culture and Basic Investigations he was started on IV Piperacillin Tazobactam (Pip Taz) with 30ml/Kg Fluid bolus

According to the local guidelines[12]. In the mean time Point of Care Ultrasound (POCUS) was done and IVC at admission was kissing(was fully collapsed) and reassessment done after bolusus showed partialy filled IVC and BP was below 90/60 and patient was stated on Ionotropes (IV Noradrenaline Infusion titratred upto 0.6 mic/kg/min) to maintain the Mean Arterial Pressure (MAP) above 65.

VBG Revealed marginal Acidosis with Severe lactic academia (Lactic acid 7.8 mmol/L), FBC showing ANC, Hb & Platelets respectively were 0.02 × 10(9)/l, 7.7 g/dl & 49 × 10(9)/l, Point of care CRP was 117, serum sodium was 130 and Pottasium was 5.0 with elevated liver enzymes and rising creatinine of 140 with Zero Urine output for the last few hours and ECG Showed Sinus tachycardia with CXR showed Left lower lobar shadowing (Figure 1) suggesting Chest as the infective focus.

All supportive management strategies were tried and hematologist opinion was sought on Subcutaneous administration G CSF in the acute set up. Within 1 hour of admission, patient deteriorated and passed away. Breaking of the bad news to the son of the family done by the treating doctor and Written informed consent was obtained from the son of the patient for participating in the case report.

Management Time Line

Time and process

9.30 am	Time of admission
9.35 am	ABCDE Assessment, Stated on High flow oxygen, Large bore IV Cannula inserted, blood samples taken for and Basic investigations and blood cultures, started on IV Fluids 30ml/Kg Fast Bolus.
9.40 am	Collateral and by stander history taken, old medical records retrieved and analyzed.
9.45 am	Consultant Emergency Physician opinion was taken on antibiotics.
9.50 am	Patient was given stat dose of IV Pip Taz and was started on IV noradrenaline infusion via peripheral line (Available)
9.55 am	POCUS was done and IVC and other assessments were done. Patient was catheterized and had a central line access for the continuation of ionotropes.
10.05 am	Urgent FBC was traced.
10.10 am	Hematologist opinion was sought via exchange line. On call Medical team was informed and opinion was appreciated.
10.15 am	IV Ionotropes titrated up after reassessment
10.20 am	Urgent Inward X ray arranged and taken.
10.25 am	Urine output measurement done (was Nil) and family was informed about the patient by the treating team and emergency physician.
10.30 am	Patients serum reports were traced over the phone.
10.35 am	Patient went into cardiac arrest and was resuscitated with full effort.
11.00 am	Confirmed Death and breaking of the bad news to the family done by the treating team.

Discussion and Conclusions

Sepsis is a life-threatening organ dysfunction syndrome caused by a deregulated host response to infection, associated with a mortality rate over 25%, that has been designated a global health priority. Neutropenic sepsis is one of the most common presentation with regard to an immunocompromised host as in this case. Identifying and Treating sepsis as early as possible with appropriate protocols improves the general outcome and is of paramount importance.

[7]While treating the patient we followed, The new "Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021" provides guidance for the clinician caring for adult patients with sepsis or septic shock. [8]

During the assessment of the management we found the patient to have severe neutropenia and several; studies have considered the use of G CSF Therapy as well. There is no current evidence supporting the routine use of G-CSF or GM-CSF in patients with sepsis. Large prospective multicenter clinical trials investigating monocytic HLA-DR (mHLA-DR)-guided G- CSF or GM-CSF therapy in patients with sepsis- associated immunosuppression are warranted.(9) So that we didn't start the patient on G-CSF yet sought the hematologists' opinion. To maintain the MAP Mean Arterial pressure we had to start the patient on Noradrenaline as the first line vasoactive support and according the surviving sepsis guidelines [8]Time critical administration of appropriate antibiotic therapy is the cornerstone of the management of severe infections[10] The utmost necessity for immediate Empirical broad-spectrum antimicrobial therapy for selected patients with severe sepsis may be life-saving, but may also make health care team to overuse antibiotics and increase the likelihood of antibiotic resistance. Therefore, this approach comes with the obligation to try to control resistance by de-escalating therapy once serial clinical, microbiologic and laboratory data become available. De-escalation can be in the form of shorter duration of therapy, less broad-spectrum agents, fewer drugs, or a combination of these interventions [11]

The rapidity of empiric therapy and the choice of specific agents are determined by the clinical scenario of the patient with suspected sepsis.

Usually Immediate treatment is given to those who are suspected to have a possibility of infection, and severe illness and or shock. If biomarkers of infections such as C-Teactive Protein or procalcitonin are not much elevated, and the patient is clinicallynot stable and not severely ill, immediate therapy is not necessary, and some patients might even bacterial infection free requiring proper evaluation for fever. Specific empiric antibiotics are decided upon with a evaluation of of the commonest and highly possible site of septic focus (lung > abdomen > catheter- associated infection > urinary tract infection). Each focus has a group of likely pathogens, but these can vary, depending on patient-specific risk factors for resistance, and local ICU patterns of drug-resistant organisms. In sepsis, gram-negatives are more common than
gram-positive, but some patients may also have fungal infection [11]

In this case; we suspected lung as the source of sepsis; we started the patient on IV Piperacillin and Tazobactam (Pip Taz) Depending on the local guidelines, patient previous antibiotic therapy, severity of the infection and microbiological susceptibility patterns.[12]

Regarding Oxygen therapy we continued High Flow Oxygen via NRBM and patient was maintaining the oxygen saturation with 100% O2 10-15l/min and oxygen therapy was escalated. Noninvasive ventilation is the first-line therapy in patients with acute hypercapnic respiratory failure because of pneumonia according to the studies. [13]

During the assessment we noticed the patient was not producing urine and going into possible acute kidney Injury and HCO3- was going down with acidosis and later creatinine was found to be high. Eventhough some practitioners use sodium Bicarbonate in such circumstances we didn't start the patient on sodium bicarbonate because the evidence is limited evidence [14]. Instead, appropriate fluid management with IV normal saline done by repeatedly assessing IVC, MAP, IP and OP chart and other objective measurements.

Despite the management patient deteriorated and we would like to think in deep of the contributing factors that led to the failure of the management. Mainly we see the late presentation as the primary cause and poor knowledge and awareness of the sepsis among the risk population. Also we think that this patient must have been treated partially during the previous hospital administration and he was poorly evaluated depicted by the fact that he was in the verge of severe neutropenia

despite the lower normal counts in a severe infection. We think that the patient must have been started on colony stimulating therapy before developing sepsis rather than considering during the sepsis though there is enough drug deficiencies exist in the government sector. Also Hospital Acquired infection could be the cause of sepsis which is due to poor health practices.

Recommendations

Its very vital to identify and treat the sepsis early despite the immunity concerns. Special care should be shed in immunocompromised hosts to detect severe neutropenia earlier and treat accordingly and the host should be very well educated about the sepsis and fatal consequences. For the patient education regarding various consequences of immunosuppression including neutropenic sepsis, we suggest leaflets, education programmes, community awareness programmes by multimedia and posters seen at the common places in the hospital with the support of the administration.
Also general practitioners should be educated to recognize early and treat neutropenic sepsis very sooner than usual sepsis and also the risk population should undergo proper screening at the least with full blood counts. There should be proper record maintaining by the oncology team so that the data retrieval for the emergency management will be made easier and closed loop communication should be maintained between the oncology, medicine, hematology and emergency team during admissions to avoid the unnecessary delay in the management. Local antibiotic guidelines should be updated by the microbiology team depending on the availability of the resources as well (due to the resource poor availability of essential resources in the country). Treating medical teams should consider the fact of fatal consequences in the risk population by proper education and awareness programmes and feedback loop should be created among different entities with clinical auditing not to point out any one but to rectify deficiencies and take health enhancement forward in a more productive and sustainable way.

Also we recommend general practitioners to have special concerns in evaluation and treatment of immunocompromised patients with regard to treat infections completely, to avoid resistance and post treatment close scrutiny. Health education and sanitary conditions in the hospitals should be scruitinized and rectified along with the replenishment of resources.

Conflict of interest statement

All the authors declare they do not have any conflict of interest.

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A rare case of Transitional cell carcinoma of the distal urethra in a 79-year-old woman.

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Key Words:

Primary urethral carcinoma, Transitional cell carcinoma.

Abstract:

A 79-years-old women with transitional cell carcinoma of the distal urethra involving left side of the lower vaginal wall is reported due to the rare incidence of it.

Introduction

Cancer is a major health challenge to the modern medicine. Oral Cavity, breast, thyroid, lung, uterus, colorectal and esophageal malignancies are the common malignant diseases in Sri Lanka [1].

Primary urethral cancers (PUC) are very rare accounting less than 1 % of all the urological malignancies[2] and its far less in women when compared to men[3]. It presents with non-specific symptoms and hence often underdiagnosed. The median age of diagnosis is 60 years[4] and peaks in age above 75 years old [5].

We report a case of transitional cell carcinoma of the distal urethra involving left side of the lower vaginal wall in a 79-years-old women.

Case History

A 79-years-old widow with 4 children all were delivered vaginally presented to her General Practitioner (GP) with the complaint of left sided lower abdominal pain and sense of lower abdominal distension for one-month duration. She had no urinary tract symptoms at any point after the vaginal hysterectomy for UV prolapse at her age of 60 years.
Her medical history was significant for type-II diabetes mellites and bronchiectasis for which she was on a follow-up with good compliance.

She had no urinary tract infection (UTI), stones in the urinary tract, repeated urinary catheterization, urethral stricture, pelvic radiation, other urinary cancer, sexually transmitted diseases (STD), urethral caruncle or diverticulum. She had no history of smoking, family history of cancers.

Her GP detected few enlarged left-sided inguinal lymph nodes and referred to the general surgeon. At that point an ultra sound scan (USS) performed on her showed soft tissue swelling of lower abdominal wall with dilated vessel and 3 cm x 3.2 cm size hypoechoic suspicious inguinal lymph node with the loss of fatty hilum.

The suspicious lymph node was biopsied by surgical team and histology showed the features of transitional cell carcinoma warranting to exclude the primary urological malignancies. Hence, a contrast enhanced computerized tomography (CECT) of chest, abdomen & pelvis was performed on her. CECT didn't reveal any abnormality except lung bronchiectasis & 1.2 cm size simple cyst in the right kidney.

Therefore, she was referred to the urologist and underwent a flexible urethro-cystoscopy under local anesthesia which showed left sided lower vaginal wall mass with embedded distal urethra into the tumor which warranted the involvement of Surgical oncologist. She ended-up under the care of surgical oncologist with 3 months delay from her initial presentation to the GP.

Her blood biochemistry and urine analysis were within normal limit at the presentation to the Onco-surgical unit. Within 5 days surgical oncologist performed wide local excision of the lesion with distal urethrectomy and ipsilateral superficial inguinal block dissection.

Image 1. Macroscopic appearance of primary tumor arising from distal urethra and extending to lateral vaginal wall.

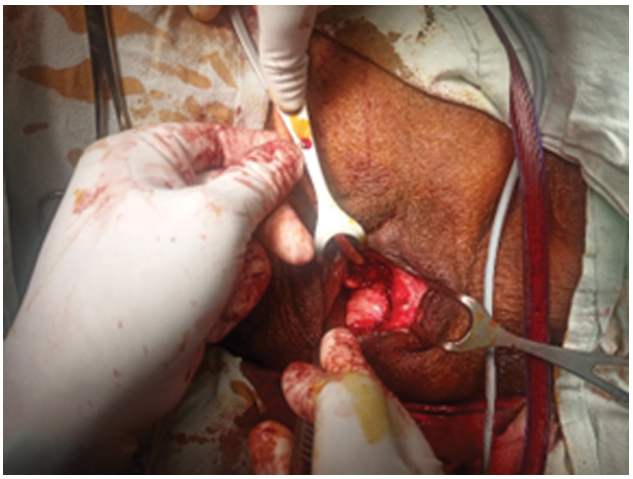

Image 2 after the en masse dissection of primary tumor along with the distal urethra.

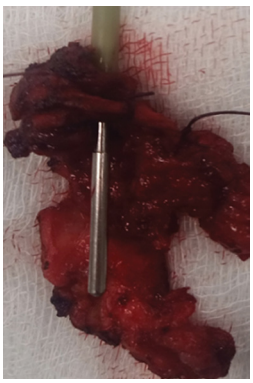

Image 3. The diathermy forceps shows the part of distal urethra where the tumor originates and hence was resected.

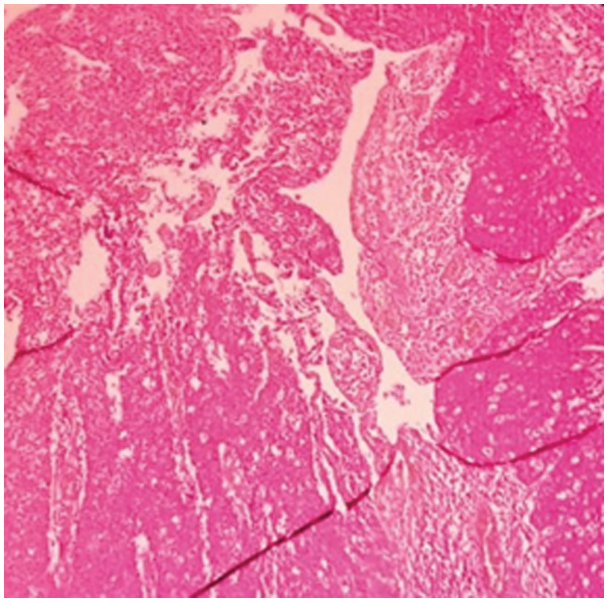

Image 4 distal urethra focally lined by a stratified squamous epithelium and infiltrated by a poorly differentiated carcinoma, favouring high-grade urothelial carcinoma.

Discussion

Primary urethral malignancy is very rare but highly aggressive entity and it is exceptionally rare in women. The main dilemma of rare malignancies is the diagnostic delay due to insufficient clinical knowledge and experience[6].

Urothelial carcinoma of the urethra is the main histological variant of PUC accounting 54-65% followed by squamous cell carcinoma squamous cell carcinoma (SCC) which accounts 16-22% and adenocarcinoma (AC) accounts 10-16% [7] However, Transitional cell PUC is more among women when compared with men.

Etiology of PUC differs to male and female. Risk factors for male PUC includes urethral stricture, chronic urethral irritation after intermittent catheterization or urethroplasty[8], external beam radiation therapy (EBRT) , radioactive seed implantation and chronic urethral inflammation/urethritis following sexually transmitted infection. That of women includes urethral diverticula and recurrent UTI[8].

Majority of the patients present in the late stage of the disease and hence has poor prognosis. Presenting symptoms includes macroscopic hematuria, bloody urethral discharge, extra urethral mass, pelvic pain, urethra-cutaneous fistula, abscess, purulent/ malodor discharge, perineal pain, urinary retention, overflow incontinence, dyspareunia, urethral mass or protruding meatal mass.

Our patient presented with left sided lower abdominal pain and sense of lower abdominal distension with no other symptoms. Similar presentation has been reported in the literature also [9]. Since she is a widow and menopaused, she had no chance for sexual intercourse which could have been caused dyspareunia in this case which might had helped for early detection.

Initially PUC spreads by local invasion into periurethral tissues, vagina, vulva and bladder neck and hence it may present with hard lump in the vulva, vagina, labia and perineum [10].

Clinical examination includes the examination of external genital, digital rectal and bilateral inguinal lymph nodes assessment [11].

Proximal urethra drains the lymph into obturator and internal iliac nodes while that of distal urethra drains into inguinal nodes. Our patient had transitional cell carcinoma of distal urethra. She had palpable ipsilateral inguinal node at her presentation.

Magnetic Resonance Imaging (MRI) is the standard for imaging the urethral malignancy and it is not available in the tertiary care Cancer treatment center for entire eastern province of Sri Lanka. Therefore, she underwent an USS which showed a soft tissue swelling of lower abdominal wall with dilated vessel and 3 cm x 3.2 cm size hypoechoic suspicious inguinal lymph node with the loss of fatty hilum.

Then the suspicious lymph node was biopsied and it showed the features of deposit from transitional cell carcinoma. The CECT assessment for the distant metastasis was negative for primary or secondary malignant lesions.

The prognosis depends on tumor staging based on the TNM classification, age > 65, histological type. The treatment modality little varies in men and women. Localized PUC of male is treated with penile preserving surgery with additional iliac/inguinal lymph node dissection. Distal PUC in women is treated with radical urethrectomy or urethral sparing surgery with additional inguinal block dissection.

Urethro-cystoscopy performed on our patient showed left sided lower vaginal wall mass with embedded distal urethra into the tumor. Therefore, she underwent an en masse wide local excision of the lesion with distal urethrectomy and ipsilateral superficial inguinal block dissection due to histologically proven nodal metastasis.

Histology showed distal urethra focally lined by a stratified squamous epithelium and infiltrated by a poorly differentiated carcinoma, favouring high-grade urothelial carcinoma.

Conclusion

Even though the primary urethral malignancies are extremely rare in the women, clinicians should have a suspicious of it to prevent the unnecessary delay in the diagnosis which is the single most important factor effecting the tumor grade and stage.

Consent

Written informed consent has been obtained from the patient to publish the images and case details for the development of knowledge on urethral cancers.

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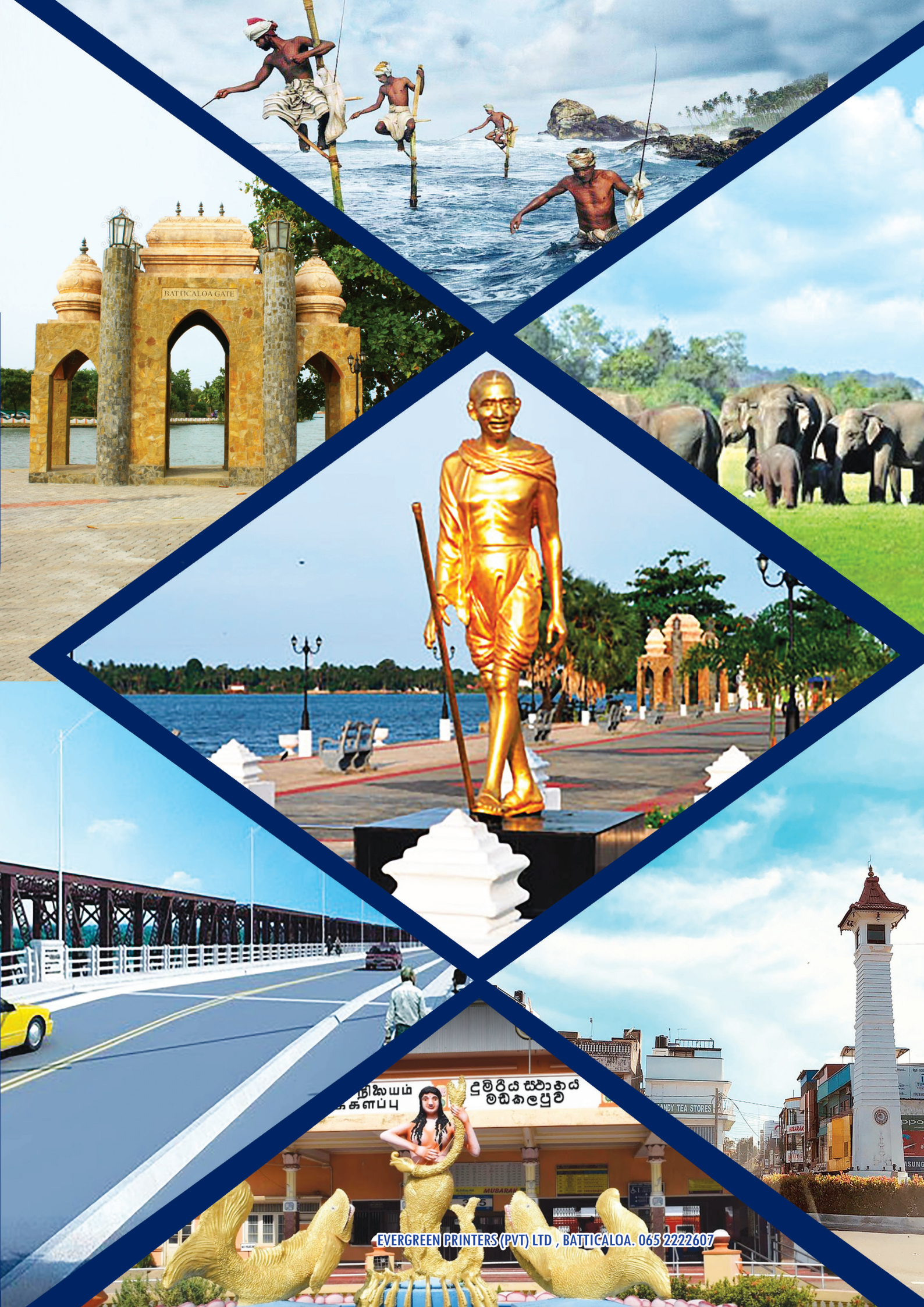

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