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RT-PCR in Diagnosis of COVID-19

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Corona virus disease 19 (COVID-19) demonstrates greater impact on global public health, economy, education, tourism and sports etc. So, rapid and accurate investigation of COVID-19 is very important for proper management. We can diagnose COVID-19 by detecting the presence of Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) in the samples. SARS-CoV-2 can be identifying either by the presence of the virus or antibodies produced in response to its infection.[1] COVID-19 testing include the test for the current infection or past infection. These tests confirm the presence of a virus in the body (current infection) or any past infection that causes COVID-19. An antibody test will show whether or not someone has developed antibodies against COVID-19 after exposure or vaccination. This test cannot confirm the active infection. Early and accurate detection of COVID-19 will help to trace and control the source of infections.[2]

There are two main types of diagnostic tests for COVID-19 infection. These are antigen tests and molecular tests. Antigen tests are rapid tests, which detect certain proteins on the surface or in the virus, are economical, efficient, and fast. Many of these tests have been authorized by FDA for emergency use, some even in the habitat environment. They can be used to make a clinical diagnosis in symptomatic patients in the first five days of symptoms. Molecular tests are more accurate and current standard for diagnosing COVID-19. These tests look for the genetic materials of virus. There are multiple types of molecular tests. Among them polymerase chain reaction (PCR) test is most commonly used and accurate.[3] PCR is an artificial method of cloning or amplification of selected fragment of DNA. It is very fast and even a trace amount of target DNA can be amplified. The average PCR involves 30-35 cycles and it can produce millions to billions copies of target DNA within few hours. Reverse transcription (RT) is a process of synthesis of DNA from RNA catalyzed by the enzyme reverse transcriptase.[4]

Real-time reverse transcription polymerase chain reaction (rRT-PCR) test is used for detection of nucleic acid from SARS-CoV-2. RT-PCR first uses reverse transcription to obtain DNA from viral RNA, followed by PCR to amplify that DNA. Real time detection of genetic materials makes it more sensitive test; as a result, rRT-PCR is the most commonly used diagnostic test for detection of COVID-19 within few hours to days.[5]

Sensitivity may be defined as the capacity of a test to identify all infected people and specificity is the ability of a test to detect a particular antigen.[2] Sensitivity of rapid molecular tests varied according to test brand. Sensitivity of RT-PCR test is determined by using data from different studies.[6] In one study, the average sensitivity of ID NOW was 73.0% (95% CI- 66.8% to 78.4%) and average specificity 99.7% (95% CI- 98.7% to 99.9%; 4 evaluations; 812 samples, 222 cases). In case of Xpert Xpress, the average sensitivity was 100% (95% CI- 88.1% to 100%) and average specificity 97.2% (95% CI- 89.4% to

99.3%; 2 evaluations; 100 samples, 29 cases).[6] Dinnes et al.[6] showed higher sensitivity in the first week after symptom onset (78.3%, 95% CI- 71.1% to 84.1%; 26 evaluations; 5769 samples, 2320 cases) than in the second week of symptoms (51.0%, 95% CI- 40.8% to 61.0%; 22 evaluations; 935 samples, 692 cases). Sensitivity was high in those with cycle threshold (Ct) values on PCR ≤25 (94.5%, 95% CI 91.0% to 96.7%; 36 evaluations; 2613 cases) compared to those with Ct values >25 (40.7%, 95% CI 31.8% to 50.3%; 36 evaluations; 2632 cases). A cycle threshold of 20 cycles would be adequate to detect SARS-CoV-2 in a highly infective person. Cycle thresholds above 34 cycle thresholds increase the chance of giving false positive results.[7] Xu et al.[8] mentioned highest sensitivity (100%) of RT-PCR test at week one, followed by 89.3%, 66.1%, 32.1%, 5.4% and 00% by six week.

Regarding sample collection for RT-PCR test, Centers for The Disease Control and Prevention (CDC) recommends upper respiratory specimen. Samples may be collected from nasopharyngeal swab, throat swabs, deep airway material collected via suction catheter, sputum or saliva. As nasal and throat swabs saliva may be an effective sample that may reduce the infection risk for collectors due to less chance of contamination. Saliva can be collected by the quarantined people themselves and that is more comfortable for other patients also. In another study[8] explained the sensitivity and specificity of the saliva sample were 84.2% (95% CI- 60.4% to 96.6%), and 98.9% (95% CI- 96.1% to 99.9%), respectively. For COVID-19 diagnosis the nasopharyngeal swab remains the most widely used sample. Its two main drawbacks are its technical difficulty and painfulness. Well-trained testing teams should help increase the sensitivity of the test and make it less unpleasant. From a diagnostic point of view, it is important to note that nasal and throat swabs seem less suitable for diagnosis, since these materials contain considerably less viral RNA and the virus may escape detection if only these materials are tested. The overall sensitivity were 100.0%, 67.5% and 37.5% for nasopharyngeal swab, nasal swab and saliva swab samples.[9] The likelihood of detecting the virus depends on collection method and how much time has passed since infection. Tests performed with throat swabs are reliable only in the first week. Thereafter, the virus may abandon the throat and multiply in the lungs. In the second week, sputum or deep airways collection is preferred.[9] It was specified that, sensitivity of clinical samples by RT-PCR was 63% for nasal swab, 32% for pharyngeal swab, 72-75% for sputum, and 93-95% for Broncho-alveolar lavage.[10]

Some evidence showed that, a good proportion of new mild cases that were positive, after quarantine or discharge from hospital re-testing via RT-PCR are not infectious. They simply demolish harmless virus particles by their immune system. So, an international effort to standardize and periodically calibrate RT-PCR testing is hardly needed.[11]

In conclusion, the results of RT-PCR tests must be cautiously interpreted. Multiple samples collected from different sites of respiratory tract in different times are distinguished carefully. Sample from the lower respiratory tract should be tested in case of negative result in RT-PCR with clinical features suspicious for COVID-19. Proper sampling, good laboratory practice, using high-quality extraction and standard RT-PCR kit could improve the accuracy of results.

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ORIGINAL ARTICLE
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Comparison of Axial Triradius Angle in Palms between Schizophrenic Patients and Healthy Controls

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ABSTRACT

Introduction: *Dermatoglyphics is the branch of medical science that is concerned with the study of dermal ridges present on fingers, palms, toes and the soles of human. This study was conducted to measure a dermatoglyphic trait axial triradius angle in schizophrenic patients. Difference of axial triradius angles in between schizophrenic male and female were also calculated.* ***Methods:*** *This cross-sectional comparative study was conducted in Department of Anatomy at Rajshahi Medical College, Rajshahi, Bangladesh from January, 2017 to January, 2018. A total number of 400 subjects were enrolled for this study. Among them, 200 were schizophrenic patients and 200 were healthy controls. Their palm prints were taken and ATD angles were observed.* ***Results:*** *The axial triradius angles were wider in healthy controls than schizophrenic patients. Sex variation showed axial triradius angles wider among schizophrenic females.* ***Conclusion:*** *The findings showed differences in dermatoglyphic trait, axial triradius angle between schizophrenic patients and healthy controls. So, this study may provide us important documents in the prediction of schizophrenia.*

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INTRODUCTION

Dermatoglyphics is a Greek word; "derma" means skin and "glyphic" means to curve.[1] The meaning of dermatoglyphics is "skin curving". The skin ridge patterns are formed on finger, palm, sole and toes.[2] The analysis of skin ridge patterns by studying prints of them is known as dermatoglyphics.[3]

The scientific study of Dermatoglyphics is credited to a Czech physiologist and biologist, Joannes Evangelista purkinjee in 1823.[4] The word "Dermatoglyphics" was first utilized in medical research by an anatomist named Harold Cummins in 1926.[5]

Axial triradius (ATD) angle is an important dermatoglyphic trait. The ATD angle is formed by drawing lines between the triradii below the index and little digits and the most proximal triradius on the hypothenar region of the palm. Depending upon the proximity to the lower

margin of the palm it is designated as t, t' and t".[6] The value of angle <45º corresponds to t, values intermediate 45º-56º is t' and >56º is t" (Figure 1).[7]

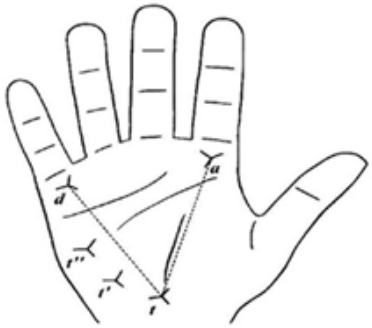

Figure 1: Axial triradius angle

Schizophrenia is a clinical syndrome of variable, but profoundly disruptive, psychopathology that involves cognition, emotion, perception and other aspects of behaviour. The expression of this manifestation varies across patients but the illness is always severe and is usually long lasting. Schizophrenia is equally prevalent in men and women. The incidence and prevalence rates are roughly equal worldwide which is about 1%.[8]

The brain and skin ridges are developed during same gestational period, between 11th to 24th weeks of gestation.[9] Both of them have originated from the ectodermal germ layer.[10] So, there may have some biological and clinical values associated between them.[11] The types of ridge pattern develops in palm are genetically determined. Any mental anomalies in embryo will effect on development of ridge pattern.[12] An interesting thing is that the movement of hand in uterus do not influence later on development of palmer creases.[13]

In the modern world, dermatoglyphics and its traits has some important role in medical research. Specific dermatoglyphic traits presenceis an accompanying feature of various groups of disease such as chromosomal aberrations, sickle cell disease, psoriasis, cancer, epilepsy, congenital heart disease, lupus erythematodes, mental disorder.[14] There are some exceptional conditions also in which there is absence of fingerprints termed as adermatoglyphia. The conditions are in cases of leprosy, patients being treated with anticancer drugs, ectodermal dysplasia etc. X-ray, grievous injuries can cause harm to the skin prints.[15]

In the present study, schizophrenic patients were undertaken as a mental disorder. So, this comparative study was aimed to find out the differences of ATD angles on the palms of hand in male and female schizophrenic patients.

METHODS

This cross-sectional comparative study was carried out in the Department of Anatomy at Rajshahi Medical College, Rajshahi in between January, 2017 to January, 2018. The research protocol was reviewed and approved by the Institutional Review Board (IRB) of Rajshahi Medical College, Rajshahi. Two groups of people within the age of 15-40 years were purposively selected. One group was comprised of 200 individuals of healthy controland another group of 200 schizophrenic patients. Selection of schizophrenic patients were performed by a qualified psychiatrist. Persons having a history of drug or alcohol abuse, an identifiable neurological disorder (e.g. Seizure, multiple sclerosis, etc.), head injury, any signs of mental retardation, psoriasis and permanent scar on any of the either hand were excluded. Informed written consent was taken from each study subject before data collection. The prints of palms were taken by ink and pad method. All the subjects were asked to wash their palmer aspects of hand clearly with soap and water. After drying by soft towel, the palms were placed on the ink pad. Then their palms of both hands were placed on white papers and impressions were taken. Firstly, the axial triradius (ATD) angles were noticed by magnifying glass. Then, lines drawn by joining the points and angles were examined (Figure 2). The ATD angles of right and left hand were analyzed according to the subject and sex.

Figure 2: Examination of palm prints to reveal Axial triradius angle

After data collection, processing and analysis were done. Observations and results were noted carefully. The results were presented in the forms of tables with necessary interpretation and inference. Collected data were analyzed by using computer based on SPSS software version-16. The test of significance was conducted by using the Chi square test (χ^2) and independent '*t*' test. A *p* value ≤0.5 was considered statistically significant.

RESULTS

ATD angles of right hand in schizophrenic patients was <45° in 91% (182) cases and in case of left hand it was <45° in 88.5% (177) cases (Table I).

Table I: Axial triradius angles of schizophrenic patients (n-200)

Degree of angle	Right hand		Left hand	
	Frequency	Percentage (%)	Frequency	Percentage (%)
<45	182	91.0	177	88.5
45-56	18	9.0	22	11.0
>56	00	0.0	1	0.5

Right hand: Mean angle = (39.28±4.18°); Range: (30°-54°); Left hand: Mean angle = (39.61±5.25°); Range: (22°-69°)

ATD angles of both hands in healthy controls were <45° in 71.0% (142) subjects (Table II).

Table II: Axial triradius angles in healthy controls (n-200)

Degree of angle	Right hand		Left hand	
	Frequency	Percentage (%)	Frequency	Percentage (%)
<45	142	71.0	142	71.0
45-56	52	26.0	47	23.5
>56	6	3.0	11	5.5

Right hand: Mean angle = (43.00±6.60°); Range: (33°-85°); Left hand: Mean angle = (43.35±7.32°); Range: (32°-84°)

In the right hand, ATD angles were significantly narrow (<45°) in schizophrenic patients than healthy controls. The mean degree of ATD angle was also significantly (*p*<0.001) different between two groups (Table III).

Table III: Comparison of ATD angles of right hand between schizophrenic patients and healthy controls

Degree of ATD angle	Group		*p* value
	Schizophrenia (n-200)	Healthy controls (n-200)	
<45	182 (91.0)	142 (71.0)	<0.001*
45-56	18 (9.0)	52 (26.0)	
>56	0 (0.0)	6 (3.0)	
Mean degree of ATD angle	39.3±4.17	43.0±6.6	<0.001**

Figure in the parenthesis denote corresponding %
*Data were analyzed using Chi square Test (χ^2);
** Unpaired t-test was done to analysis the data.

In case of left hand, the majority (177, 88.5%) of schizophrenic patients had the ATD angle <45º than healthy individual whereas the angle between (45-56)º and >56º was more prevalent in healthy controls. The mean degree of ATD angle was significantly (p<0.001) different between two groups (Table IV).

Table IV: Comparison of ATD angles of left hand between schizophrenic patients and healthy controls

Degree of ATD angle	Group		*p* value
	Schizophrenia (n-200)	Healthy controls (n-200)	
<45	177 (88.5)	142 (71.0)	<0.001*
45-56	22 (11.0)	47 (23.5)	
>56	1 (0.5)	11 (5.5)	
Mean degree of ATD angle	39.6±5.2	43.3±7.3	<0.001**

Figure in the parenthesis denote corresponding %; *Data were analyzed using Chi square Test (χ^2)
** Unpaired t-test was done to analysis the data.

Although the ATD angle <45º was more in schizophrenic males than that of females and the angle between (45-56)º were more in schizophrenic females but above variations were not statistically significant. The mean degree of ATD angle was not significantly different between the groups (Table V).

Table V: Comparison of ATD angle of right hand between schizophrenic male and female

Degree of ATD angle	Group		*p* value
	Schizophrenic male (n-100)	Schizophrenic female (n-100)	
<45	94 (94.0)	88 (88.0)	0.216*
45-56	6 (6.0)	12 (12.0)	
>56	0 (0.0)	6 (3.0)	
Mean degree of ATD angle	38.8±3.8	39.7±4.4	0.15**

Figure in the parenthesis denote corresponding %;*Data were analyzed using Chi square Test (χ^2)
** Unpaired t-test was done to analysis the data.

The ATD angle between (45-56)ºwere more in schizophrenic females than males and the angle <45º were more in schizophrenic male. Two groups were also significantly (p<0.001) heterogeneous in terms of Mean degree of ATD angle (Table VI).

Table VI: Comparison of ATD angle of left hand between schizophrenic male and female

Degree of ATD angle	Group		*p* value
	Schizophrenic male (n-100)	Schizophrenic female (n-100)	
<45	95 (95.0)	82 (82.0)	0.014*
45-56	5 (5.0)	17 (17.0)	
>56	0 (0.0)	1 (1.0)	
Mean degree of ATD angle	38.3±4.5	40.8±5.6	0.001**

Figure in the parenthesis denote corresponding %; *Data were analyzed using Chi square Test (χ^2)
** Unpaired *t*-test was done to analysis the data

DISCUSSION

In this study, axial triradius (ATD) angle was distributed and compared according to the frequency of their common types and their mean. In the present study, frequency of the ATD angle of schizophrenic patient's right and left hand was distributed in Table I. In the right hand of schizophrenic patient ATD angle was <45° in more than 90% cases but in left hand it was 88.5%. Mean angle was 39.28±4.18° in right hand and 39.61±5.25° in left hand. The healthy control's ATD angle was <45° in more than 70% cases both in right and left hand. Their mean angle was 43.00±6.60° in right hand and 43.35±7.32° in left hand.

ATD angles were significantly (p<0.001) narrow (<45º) in right hand of schizophrenic patients than healthy controls. In case of left hand, the majority of schizophrenic patients had the ATD angle <45º than healthy individual whereas the angle between (45-56)º and >56º was more prevalent in healthy controls.

When we compared about the measurement of ATD angles, common type of both hands between schizophrenic patient and the healthy control group it was found that in right and left hand most of the schizophrenic patient's ATD angles was t (<45°). ATD angle t' (45-56)° was more frequent in both the hands of healthy controls. These difference was statistically significant (p<0.001) for t (<45°) type.

Mellor[16] conducted a quantitative study, where he calculated the ATD angle which has no similarities with the findings of the present study. His result showed that the mean ATD angle was more in schizophrenic cases, but in the present study mean ATD angle was more in normal male and female.

In right hand, Type t ATD angle (<45°) was more common in schizophrenic male than schizophrenic female but variations of angle were not significant. In the left hand type t (<45°) was more common in schizophrenic male that is significant (p<0.014). Type t' (45-56)° was more frequent in schizophrenic female. In both the hand t" (>56°) was absent in schizophrenic male. In comparison to their mean value schizophrenic female has higher mean value than schizophrenic male in both hand and the differences was significant in their left hand (p<0.001).

Kudalkar et al.[17] conducted a study where they compared ATD angles with their mean of both hands in between schizophrenic and control group and found significant differences. Their study has few similarities with the present study. In both hand they found that mean ATD angle was lower in schizophrenic male but higher in schizophrenic female. The present study result also showed that, female schizophrenic patient has higher mean ATD angle than male schizophrenic patient in both hands.

Sengupta et al.[18] had done a study in India, where they found marked differences in ATD angle compared between case and control group. Their observation showed that the frequency of type t (<45°) was dominant in male controls that was not similar to the present study findings. But in case group t' (45-56)° was highest in male and t" (>56°) was common in female. These findings have similarities with the present study.

Singh[19] found increase ATD angles in schizophrenic males and right hand of schizophrenic

females. But the differences were not statistically significant. Present study showed increase ATD angles in healthy controls significantly.

Bhusaraddi et al.[20] found slight increase of ATD angles in schizophrenic males only and the difference was not significant. But present study showed an increase of ATD angles in healthy controls and the difference was statistically significant.

Bulgir et al.[21] found wider ATD angles in schizophrenic males and schizophrenic females than healthy controls. The differences were statistically significant only in females. But the findings have no similarities with the present study. The present study result showed significant increase of ATD angles in healthy control group.

The variations of the results which were observed between the different studies might be due to variations in sample size, genetic factor and environmental factor.

CONCLUSION

Axial triradius angles were more in healthy controls than schizophrenia. Sex variation of axial triradius angles in schizophrenia showed that it was more among the schizophrenic females. Dermatoglyphic trait, ATD angle has its own limitation when used alone but combined with other clinical features it would play an important role in the diagnosis of schizophrenia.

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Demographical Study of Suicidal Events Occurred In 2019 at the Rajshahi District, Bangladesh

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Suicide, Hanging, Poisoning

ABSTRACT

Introduction: *In Bangladesh, one of the major causes of unnatural death is suicide. Moreover, suicide is a long term social issue. However, this study was designed to analyze the demographic status of suicide occurred in the Rajshahi district in 2019.* ***Methods:*** *This cross-sectional descriptive study was conducted in the department of Forensic Medicine and Toxicology, Rajshahi Medical College, Rajshahi, Bangladesh, during January, 2019 to December, 2019. A total number of 160 study subjects were included. The data were collected from the corresponding dead bodies of suicide victims which were submitted in the Department of Forensic Medicine and Toxicology at Rajshahi Medical College for post-mortem examination. This study explores the way of suicide, sex, age, profession, religious status, and corresponding region of the suicidal events.* ***Results:*** *The most prevalent way of suicide was hanging. Most of the people were within 11 to 30 years of age and females were the highest in number. In term of profession, females were mostly housewives and the remaining were students, whereas males were mostly farmers.* ***Conclusion:*** *According to this finding, young housewives and farmers were found more prone to commit suicide.*

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INTRODUCTION

Globally, suicide has been designated as the 12th leading cause of death and a huge public health problem has been raised based on this issue.[1,2] It is one of the major public health problems in Asia and around 60% of the global suicides occur in this region but China, India and Japan share about 40% of global suicides.[3] The rate of suicide is found to be more than 2 per 10,000 population in Japan and rural China.[4] Increased prevalence of suicide was also found in India,[5] where the rate varied between 8.1 and 58.3 per 100,000 in diverse regions of India.[6] In Sri Lanka, 37 suicides per 100,000 population was recorded.[1] The rate of suicide was found to be increased in many of the asian countries because of economic, political and cultural influences along with changing social roles.[4] In developing countries, low socio-economic conditions of the people have been identified as the major influencing factor for

suicide.[7] Social and psychological pressures brought on by family disputes, failure in relationships and economic hardships are possible precipitating factors of suicide in low income countries of asia.[8]

Bangladesh is a developing country and one of the densely populated countries in the world. Suicidal event is an unusual way of death occurring daily in this country.[9] In Bangladesh, about 10,000 people commit suicide yearly, and suicide is one of the major causes of death in young adult females.[3,10] The number of suicidal events is remarkably increasing yearly.[11] But, it is a neglected public health problem in Bangladesh.[12] This is usually taken as a criminal offence and the legal administrative consequences promote to hinder disclosure of suicide events.[13] Police reports, forensic reports, and media news are the major sources of getting information about suicide, though numerous events are not being disclosed considering the long term social impact on the family.

Rajshahi is a divisional city of Bangladesh with an area of 18,174.4 square kilometres and around 20,000,000 people live here.[14] Rajshahi division comprises eight districts including Bogura, Chapainawabganj, Joypurhat, Naogaon, Natore, Pabna, Rajshahi and Sirajganj. Rajshahi is one of the major district of this division and has been divided into numerous sub-district/upazilas and thanas. Around 30,00000 people live here. But, there is lack of continuous exploration regarding surveillance and nationwide study on suicide in this region. Therefore, this study was designed to analyze the demography of suicidal events occurred in one year during 2019 at Rajshahi district.

However, this study explores the suicidal demography of Rajshahi district based on the data of autopsy performed in the Department of Forensic Medicine and Toxicology (DFMT) of Rajshahi Medical College (RMC). RMC is one of the largest governments medical college established in the year 1958, which has been conducted undergraduate and postgraduate courses of different disciplines situated in the northern part of Bangladesh at Rajshahi. The DFMT of RMC manages all the dead bodies those require post-mortem examination. As suicide is an unnatural death and most of the cases stay behind suspicious as a criminal offence and requires legal administrative procedure, dead bodies of suicide victims used to send to the DFMT of RMC for legal procedure. Therefore, all of the suicidal events must be recorded here unless there is any exception. Thus, this study explores the most authenticated data on suicidal events and as far our knowledge, this is the first study conducting suicidal demography occurred in the Rajshahi district in the year 2019.

METHODS

This cross-sectional descriptive study was conducted in the department of forensic medicine and toxicology, Rajshahi Medical College, Rajshahi, Bangladesh during January, 2019 to December, 2019. A total number of 160 study subjects were included in this study. The accumulated study subject includes only suicidal events of 2019. Demographical data were collected in preformed data collection sheet from the corresponding documents of the dead bodies submitted in the Department of Forensic Medicine and Toxicology for autopsy. Statistical analyses (percentage calculation) and graph generation were performed in Microsoft Excel (version 2007).

RESULTS

Among 160 suicide victims, 69 (43.13%) were male and 91 (56.87%) were female. According to the data, hanging was the most frequent way of suicide and 84 (52.5%) victims committed this way. Poisoning (74, 46.25%) was the second most frequent way of suicide. Only one female victim chose wounding by using sharp blade, while only one male chose jumping from height in water (Table I).

Table I: Distribution of study subjects by sex and mode of suicide (n-160)

Sex	Mode of suicide				Total (%)
	Poisoning (%)	Hanging (%)	Wounding (%)	Jumping from height (%)	
Male	31 (44.93)	37(53.62)	0 (0)	1 (1.45)	69 (43.12)
Female	43 (47.25)	47 (51.65)	1 (1.10)	0 (0)	91 (56.88)
Total	**74 (46.25)**	**84 (52.5)**	**1 (0.63)**	**1 (0.63)**	**160 (100%)**

People from 11 to 30 years old were more prone to commit suicide (Table II).

Table II: Distribution of study subjects by age groups and ways of suicide (n-160)

Age ranges (in years)	Ways of suicide	No. (%) of cases		
		Male	Female	Total
11-20	Poisoning	10 (6.25)	18 (11.25)	28 (17.5)
	Hanging	9 (5.62)	16 (10)	25 (15.63)
	Jumping from height	1 (0.62)	0 (00)	1(0.62)
21-30	Poisoning	10 (6.25)	16 (10)	26 (16.25)
	Hanging	14 (8.75)	19 (11.87)	33 (20.63)
	Poisoning	5 (3.12)	4 (2.5)	9 (5.62)
31-40	Hanging	5 (3.12)	7 (4.37)	12 (7.50)
	Wounding	0 (00)	1 (0.62)	1 (0.62)
	Poisoning	2 (1.25)	3 (1.87)	5 (3.12)
41-50	Hanging	2 (1.25)	3 (1.87)	5 (3.12)
	Poisoning	2 (1.25)	1 (0.62)	3 (1.87)
51-60	Hanging	3 (1.87)	0 (00)	3 (1.87)
	Poisoning	2 (1.25)	1(0.62)	3 (1.87)
61-70	Hanging	4 (2.5)	2 (1.25)	6 (3.75)
Total		**69 (43.12)**	**91 (56.87)**	**160 (100)**

In terms of profession (Figure 1 and Figure 2), among 69 males, the maximum were farmers (29, 42.03%). Next prevalence of suicide (11, 15.94%) was among day labourers. Students were third in number of suicidal events (9, 12.9%). On the other hand, among 91 females, 67 (73.63%) were housewives and the remaining (24, 26.37%) were students. Among the housewives, majority (34/67, 50.75%) committed suicide by poisoning.

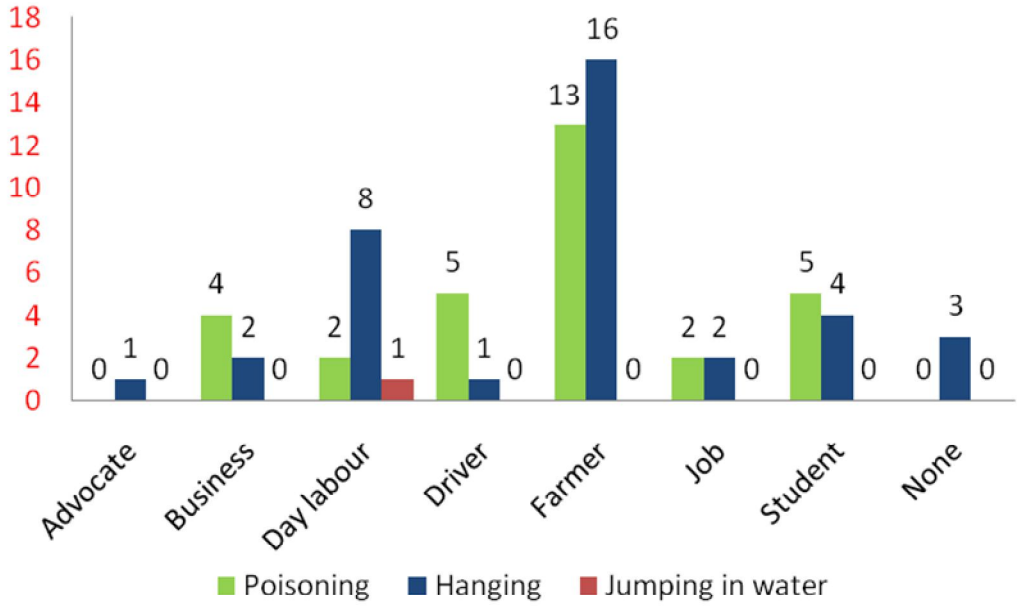

Figure 1: Distribution of study subjects (male) by profession and ways of suicide

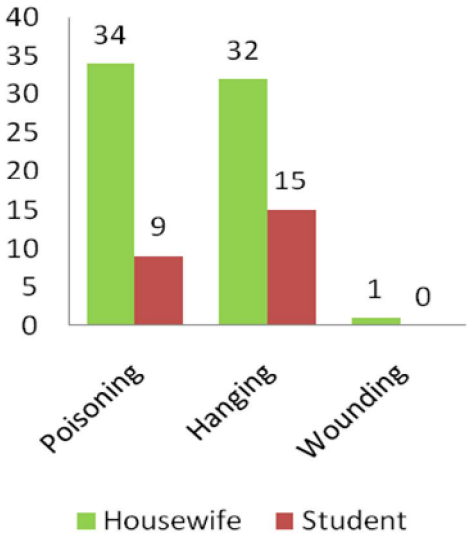

Figure 2: Distribution of study subjects (female) by profession and way of suicide

Among the 160 study subjects, 155 (96.88%) were from Islam religion and 5 (3.12%) were from other religions (Figure 3).

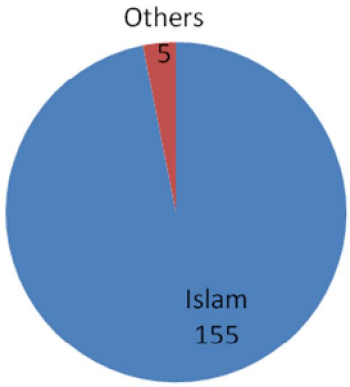

Figure 3: Distribution of study subjects by religion (n-160)

According to the distribution of study subjects by region (Table III), maximum number of suicidal events (17, 10.62%) occurred in Bagmara region. Godagari and Puthiawere the second prevalent regions, having 16 (10.00%) suicidal events in each. Boalia and Katakhali were in third place in number (13, 8.12%) of suicide events. Ten (6.25%) suicides were observed in Tanore. Suicidal events were less frequent (only 2, 1.25%) in Shahmakhdum region.

Table III: Distribution of study subjects by region (police station)

Police station	Number of victims		
	Male	Female	Total (%)
Airport	2	2	4 (2.50)
Bagha	2	6	8 (5.00)
Bagmara	5	12	17 (10.62)
Belpukur	2	1	3 (1.88)
Boalia	9	4	13 (8.12)
Charghat	2	5	7 (4.37)
Damkura	5	2	7 (4.37)
Durgapur	2	5	7 (4.37)
Godagari	10	6	16 (10.00)
Kornohar	1	2	3 (1.88)
Kashiadanga	1	2	3 (1.88)
Katakhali	5	8	13 (8.12)
Mahanpur	4	6	10 (6.25)
Matihar	1	7	8 (5.00)
Paba	4	4	8 (5.00)
Puthia	6	10	16 (10.00)
Rajpara	2	2	4 (2.50)
Shahmakhdum	2	0	2 (1.25)
Tanore	4	7	11 (6.88)

DISCUSSION

From this study, we found that the number of young female suicide victims is noticeably high and this outcome is consistent with the report explored by Mashreky et al. in 2013.[3] Besides, it was found thatfemaleswere more prone to commit suicide compared to their male counterpart and this is well believed situation in Bangladesh.[11,15] The possible factors influencing females more to commit suicide are suffering from their husband, family, and society for gift as they are mostly illiterate and economically dependent on their husband and their family members.[8] Ignorance of women power and choice is also an influencing factor of suicide among young women in Bangladesh.[16] However, we observed that people followed poison consumption, hanging, wounding, and jumping from height in water. Among those four methods, hanging was the most frequent mode of suicide and poisoning was the second most common means. Wounding and jumping from height in water were rare methods of suicide. People follow numerous ways including poison consumption, hanging, wounding, jumping from

height, drug abuse, firearm, setting themselves in fire, etc. to commit suicide.[17] The finding of this study is consistent with the data reported by a study showing that hanging was the first most common way and poisoning was the next prevalent way of suicide in Rajshahi division in 2017.[11] This finding also agrees with previous reports showing hanging[18] and poisoning[19] as first and second prevalent mode of suicide, respectively.

It was found that young people are prone to commit suicide and this finding is consistent with previous report which presented that suicide is among the five major causes of death in young people.[20]

This study revealed that the maximum number of male suicide victims were farmer. This may be due to agriculture dependency in most people. Besides, male cases, who bear their family members without any job always, struggle to meet the requirements of their families. Sometimes, they fail and become depressed. This inability of male perhaps provokes them to commit suicide. In case of female, maximum were housewives and remaining were students. In Bangladesh, number of working women is very limited. Therefore, it is very usual that most of the female suicide victims were housewives. In this study, it was found that the number of housewives were maximum in terms of profession in female and it is alarming. This situation is predicted to be a result of dependency of housewives on their husbands. Another surprising factor is that this study found only housewives and students among female cases to commit suicide. Though working female commit suicide in Bangladesh, no suicidal victim was found by this study and this outcome represents that working female does not commit suicide frequently.

In terms of religion, this study found that most of the victims were Muslim. Bangladesh is a Muslim majority country and it is not a matter of being surprised that most of the suicidal events are occurring in Muslim families.

As it was found, maximum suicides occurred in the Bagmara thana. Godagari and Puthia were the second prevalent region in terms of suicidal events. Boalia and Katakhali were in third place. However, suicides were less frequent in Shahmakhdum region. Actual causes of regional variation could not be identified.

It is difficult to find out the actual demographic picture of suicidal events of Bangladesh on the basis of this study due to short duration of study, small study subjects and single centered study. It needs multicentered study on a large study subjects for a long duration of time.

CONCLUSION

Overall, young housewives were more prone to commit suicide in Rajshahi district of Bangladesh. The findings of this study may suggest finding out the cause of suicide and taking proper preventive measures to reduce suicidal events.

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Conflict of Interest: None.

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ORIGINAL ARTICLE
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Association of Serum Potassium Disorders with Chronic Kidney Disease

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ABSTRACT

Introduction: *Chronic kidney disease (CKD) may be associated with a variety of electrolyte disturbances. One such disturbance, hyperkalemia, is of great concern to care providers, who are treating patients with* CKD. *This is because of its possible implications for patient safety, related to the potential for associated adverse cardiac outcomes. The aim of this study was to find out the association between serum potassium disturbance and CKD patients.* ***Methods:*** *This descriptive type of cross-sectional study was conducted in the department of physiology in Mymensingh Medical College over a period of one year from January to December, 2016. A total number of 140 subjects participated in this study. On the basis of selection criteria, study subjects were divided into case and control groups. Serum potassium levels were measured in all study subjects by using same Auto-analyzer.* ***Results:*** *Serum potassium level was observed in CKD patients (case group) and healthy person (control group) were 5.57±1.04 mmol/l and 4.13±0.42 mmol/l respectively. In case group, serum potassium level was significantly (p<0.03) increased with the comparison of control group.* ***Conclusion:*** *This study revealed that mild degree of hyperkalaemia is a common feature in CKD patients. It emphasizes the need for regular checking of serum potassium level in CKD patient.*

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INTRODUCTION

Chronic kidney disease (CKD) refers to an irreversible deterioration in renal function which usually develops over a period of years that initially shows some biochemical abnormalities but eventually, it causes loss of the excretory, metabolic and endocrine functions of the kidney.[1] It is a worldwide public health problem with an increasing incidence and prevalence, poor outcomes and high cost. Outcomes of CKD include not only kidney failure but also complications of decreased kidney function and cardiovascular diseases.[2]

CKD results from progressive and irreversible loss of huge numbers of functioning nephrons which leads to ill health. It is associated with significant morbidity and mortality.[3,4] Serious clinical symptoms often do not occur until the number of functional nephrons decrease at least 70 to 75 percent below normal. In fact, relatively normal blood concentrations of most electrolytes and normal body fluid volume can still be maintained

until the number of functioning nephrons reduces below 20 to 25 percent of normal.[5] Therefore, electrolyte disturbances are common features of CKD patients. Among them hyperkalaemia is most important because of its' adverse cardiac outcomes, which is a great challenge for care providers of these patients.[6]

In a healthy person, serum potassium (K^+) level is maintained in a narrow range, typically between 3.5 and 5.0 mEq/L.[7,8] This homeostatic maintenance of serum K^+ is important for many physiologic processes, such as nervous signaling, cardiac conduction, smooth muscle tone etc. In CKD, less K^+ is excreted through urine and ultimately causes hyperkalaemia. Some medications (ACE inhibitors, diuretics) are commonly used for CKD patients who might cause hyperkalaemia or hypokalaemia.[9,10]

Individuals with CKD and those with end-stage renal disease (ESRD) may experience both hyperkalaemia and hypokalaemia, in which the former typically occurs due to reduced kidney function or as a consequence of drugs such as Angiotensin Converting Enzyme Inhibitors (ACEIs) or Angiotensin-Receptor Blockers (ARBs), whereas the later is typically a consequence of diuretic administration.[11,12]

As this type of study yet not done in Bangladesh, this study aimed to establish the association between serum potassium disturbance and CKD patients.

METHODS

This descriptive type of cross-sectional study was conducted in the department of physiology of Mymensingh Medical College, Bangladesh over a period of one year from January to December, 2016. A total number of 140 subjects participated in this study. Among them 70 were healthy and 70 were diseased. In each group, male and female ratio was equal (1:1). Exclusion criteria for the study was; age <40 years and >70 years, pregnant woman, gouty arthritis, chronic liver disease, endocrine disease and malignancy, alcohol consumption, history of taking some drugs such as furosemide, thiazide, allopurinol. During visit, the presented age matched CKD patients (case group) and healthy persons (control group) were interviewed, examined and sample of blood was collected with due permission. The subjects were selected on the basis of history and clinical examination. Serum potassium level was measured by using Auto-analyzer (Electrolyte Analyzer, Biolyte 2000, Germany). All statistical analyses were done by using Statistical Package for Social Science (SPSS), version-20. Results were expressed as Mean±Standard Error (SE). Statistical significance of reference between two groups was evaluated by using students unpaired *t*-test and $p<0.05$ was considered as statistically significant.

RESULTS

Among the study subjects (n-140) including case (n-70) and control (n-70) group, male (n-35) and female (n-35) were equally distributed. Age range and mean age of study subjects were 40 to 70 years and 47.44±1.26 years respectively. Maximum number (61, 87.14%) of patients was found within 40 to 50 years of age (Table I).

Table I: Distribution of study subject by age groups

Age group (in years)	Control group (n-70)		Case group (n-70)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
40-50	62	88.57	61	87.14
51-60	3	4.29	7	10.00
61-70	5	7.14	2	2.86

In case group, male and female serum creatinine was significantly (*p*-0.0001) increased and eGFR was significantly (*p*-0.0001) decreased in comparison with control group (Table II).

Table II: Level of serum creatinine and estimated GFR (eGFR) in study subjects

Variable	S. Creatinine		eGFR		*p* value
	Control group	Case group	Control group	Case group	
Male	1.03±0.18	3.08±1.38	85.89±2.02	28.65±1.11	0.0001*
Female	0.98±0.16	2.98±1.92	70.58±1.92	30.14±0.92	0.0001*

Student's unpaired '*t*' test; *significant

Systolic and diastolic blood pressure of both male and female study groups were increased more than normal which indicates that the CKD patients were hypertensive (Table III).

Table III: Systolic and diastolic blood pressures (in mm of Hg) of different groups

Variable	Systolic blood pressure		Diastolic blood pressure		*p* value
	Control group	Case group	Control group	Case group	
Male	122.57±8.52	145.86±0.51	75.14±1.14	95.57±1.78	0.001*
Female	118.43±1.25	143.57±1.35	71.43±1.34	93.86±1.46	0.001*

Student's unpaired '*t*' test; *significant

The mean (±SE) serum potassium level in control and case group of male were 4.14±0.42 mmol/l and 5.62±1.13 mmol/l respectively. The difference between them was statistically significant (*p*-0.02).The mean (±SE) serum potassium level in control and case group of female were 4.12±0.43 mmol/l and 5.51±0.95 mmol/l respectively., Mean (±SE) serum potassium level in case group of femalewas increased and that was significant (p-0.04) (Table IV).

Table IV: Mean serum potassium level in study subjects

Variable	Serum potassium level (mean±SE) mmol/l		t-value	*p*-value
	Control group	Case group		
Male	4.14±0.42	5.62±1.13	2.35	0.02*
Female	4.12±0.43	5.51±0.95	2.09	0.04*
Total	**4.13±0.42**	**5.57±1.04**	**2.22**	**0.03***

Student's unpaired '*t*' test; *significant

DISCUSSION

Chronic Kidney Disease (CKD) is a global problem equally affecting the people of developed countries as well as developing countries.[13] It is recognized as worldwide major public health problem that characterized by progressive deterioration in renal function, which leads to irreversible loss of nephron number and their functions. This worseningof functions can occur over several months or years to progress.[14] In CKD, serum creatinine usually increases and estimated glomerular filtration rate (eGFR) decreases. Our study also shows similar variations in CKD patients. Decrease glomerular filtration rate (GFR) leads to sluggish flow of the filtered substance through the tubular lumen in CKD patients. This increases reabsorption of the creatinine causes passive back-diffusion from the lumen to the blood and increase serum creatinine in blood.[15,16] Hostetter et al.[17] suggested that reduced number of functioning nephron in CKD undergoes compensatory hyperfiltration. This adaptive response causes further renal damage by glomerular hypertrophy and glomerulosclerosis. So, filtration is hampered that may results in hyperuricaemia, increased creatinine level. Serum creatinine was increased and eGFR was decreased in both male and female cases in our

study which is consistent with the study of Coresh et al.[18] and Osama et al.[19]

In a community-based cohort study done by Culletonet al.[20] found that hypertension was significantly higher in patients with renal failure than in those with normal renal function. Sinha et al.[21] showed that, hypertension and CKD frequently coexist (86%).

Potassium homeostasis is maintained by kidneys. So, CKD patients are more prone to develop potassium disturbance than others. Both the hyperkalaemia (HK) and hypokalaemia can be experienced by CKD patients. Dangerous cardiac or neuromuscular effects may occur due to slight alteration of serum potassium level and HK is a potentially life-threatening condition which may cause cardiac complications.[21] Various causes are responsible for HK in CKD patients. Important causes are impaired glomerular filtration rate (GFR) and high dietary potassium intake. Extracellular shift of potassium caused by the metabolic acidosis of renal failure and recommended treatment with renin-angiotensin-aldosterone system inhibitors e.g. captopril, losartan etc. and potassium sparing diuretics e.g spironolactone, amiloride etc. that inhibit renal potassium excretion.[6,22] CKD with constipation causes decreased enteral elimination of potassium and therefore lead to hyperkalaemia. In Diabetes mellitus, reduced insulin levels lead to accumulation of potassium in the extracellular space.[23] In this study, most of the patients were hyperkalemic possibly due to end stage renal diseaseor use of antihypertensive drugs.

Nakhoul et al.[24] found HK in 11% of CKD patients and Einhorn et al.[6] evaluated that, regardless of treatment status, individuals with CKD were more likely to have a hyperkalaemic event than those without CKD. Salem et al.[25] established that, in patients with CKD, a compensatory response to chronic HK in which the body eventually develops a new state of potassium level which is often significantly higher than normal. Finding of our study is consistent with the study of researchers.[6,24,25] This study was done on limited number of patients for a short period of time and no staging of CKD was done. So, further studies with large sample size are needed to evaluate the adverse effects in CKD patients according to stage.

CONCLUSION

It may be concluded that, mild degree of hyperkalaemia is a common feature in patients with chronic kidney disease (CKD). So, this study suggests for regular checking of serum potassium level in CKD patients for the prevention of cardiac complications.

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Conflicts of interest: None

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CASE REPORT
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Case Series of Pott's Disease

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ABSTRACT

Tuberculosis (TB) is one of the leading infectious disease in developing countries. Pott's disease, also known as tuberculous spondylitis, is a classic presentation of extra-pulmonary tuberculosis. It is associated with significant morbidity and can lead to severe functional impairment. About 5% cases of Pott's disease develops psoas abscess. At the beginning of the twentieth century, psoas abscess was mainly caused by Pott's disease. Here, we report four cases of recently diagnosed Pott's diseases including one case of pott's disease with psoas abscess with their variable presentations. Low back pain and intermittent evening fever were common presentation. Significant weight loss was reported by three cases of them. Diagnosis was done based on history, physical examination, plain radiology, CT scan of abdomen and MRI of dorsal spine. All the patients were managed in consultation with physician, general surgeon and orthopaedician. They were treated with category I anti-tubercular drugs The patient of pott's disease with psoas abscess (Case-I) was treated with ultrasound guided aspiration of pus followed by open surgical drainage of psoas abscess with biopsy from abscess wall to confirm the diagnosis. No surgical intervention was done for the remaining three cases. All the four cases were responded well with anti-tubercular drugs found on subsequent follow up.

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INTRODUCTION

Tuberculosis (TB) is caused by infection with *Mycobacterium tuberculosis complex*, comprising of *Mycobacterium tuberculosis hominis, Mycobacterium tuberculosis bovis, Mycobacterium africanum* and *Mycobacterium microti*, of which *Mycobacterium tuberculosis hominis* is responsible in vast majority of cases. The majority of cases occur in the world's poorest nations. Recent figures suggest a decline in the incidence of tuberculosis, but its impact on world health remains significant.[1]

In TB patients, involvement of skeletal system is seen in 1%-10%.[2] Pott's disease represents 15% of extra-pulmonary TB.[3] Spinal TB or Pott's disease was first described by Sir Percival Pott in 1779, thus the term 'Pott's spine' or 'Pott's disease' was invented.[4] Psoas abscess developed from Pott's disease in about 5% cases and was first described

by Mynter in 1881. He referred to it as "Psoitis".[2] Tuberculosis is one of the oldest disease of mankind as evidences of Pott's disease were detected in the ancient mummies in Egypt and Peru.[5]

Pott's disease, although commonly diagnosed in the stage of "Spondylodiscitis", the disease process is thought to result from hematogenous spread via the venous plexus of Batson.[6] Infection usually begins in the anterior part of the vertebral body adjacent to the end plate. Subsequent demineralization of the end plate allow the subligamentous spread of infection to the intervertebral disc and adjacent anterior vertebral bodies, causing angulations of the vertebrae resulting in kyphosis and often gibbus.[6] In children, the initial infection may also start in the intervertebral disc due to their preserved vascularity.[7] Pott's disease has two distinct types. One is the classic form or spondylodiscitis, usually affecting more than one vertebrae. Another atypical, early lesion of spondylitis without disc involvement are now increasingly diagnosed.[8]

Spinal TB can include any of the following: progressive bone destruction leading to vertebral collapse and kyphosis, cold abscess formation, spinal canal narrowing by abscesses, granulation tissue or direct dural invasion resulting in spinal cord compression with neurologic deficits and secondary Psoas abscess.[9] Here we are reporting four cases of Pott's disease in this series.

The Cases

Case-I:

A female of 21 years old was admitted in North Bengal Medical College Hospital with pain in the back, low grade evening fever on and off and weight loss about 15 kg for about seven months. She had no history of Trauma, Tuberculosis (TB), Diabetes Mellitus. There was no family history of TB.

She was anaemic and had low grade pyrexia (101^{o} F). Nervous system examination findings were normal. On inspection, lateral flexion of spine was restricted and painful and there was no gibbus. On palpation, tenderness present at L_3/L_5 spine. Straight Leg Raising test: Restricted to 30^{0}. There was an intra-abdominal lump about 20x10 cm in size occupying from left lumber region to the pelvis, which was non-tender, soft in consistency and fluctuant. Her Haemoglobin-8.9 gm/dl of blood and ESR was 90 mm in 1st hour. X-ray Spine showed loss of lumbar lordosis, mild scoliosis of lumbar spine. There was erosion of L_4 vertebral body with disc space reduction between L_3/L_4. (Figure 1).

Ultrasonography of Abdomen revealed an elongated cystic lesion about 24.3x7.34 cm in size with internal septations and debri, extending from left kidney to pelvis, suggestive of psoas abscess.

CT scan of abdomen revealed evidence of destruction of vertebral body and their opposing end plate of L_3/L_5 with large amount of paraspinal soft tissue swelling and psoas abscess formation (Figure 2A, B).

Figure 1

Figure 2: (A)

Figure 2: (B)

Figure 1: X-ray of lumbo-sacral spine (both view)
Figure 2(A): Axial non-contrast CT image of abdomen showing Psoas abscess (arrow)
Figure 2(B): Longitudinal contrast CT image of abdomen showing Psoas abscess (arrow)

Case-II:

A male of 41 years old presented with low back pain back, intermittent fever and weight loss about 8 kg for about six months. His elder brother had tuberculosis five years back. There was tenderness at lower dorsal spine. Neurological examination findings were normal. His Haemoglobin-10.6 gm/dl of blood and ESR was 66 mm in 1st hour. Tuberculin skin test showed induration 06 mm at 72 hours. X-ray spine showed marginal osteophytes with disc space reduction between T_{12}/L_1 (Figure 3). MRI of dorsal spine revealed infective spondylodiscitis (likely tuberculous) involving T_{12}-L_1 vertebrae, pre and para-vertebral minimal collections, compression of corresponding bilateral exiting T_{12} and L_1 nerve roots and thecal sac indentation (Figure 4 A, B).

Figure 3

Figure 4: (A) T1

Figure 4: (B) T2

Figure 3: X-ray of lumbo-sacral spine (both view)

Figure 4 (A): MRI (T1W image) of spine showing Inhomogeneous hypo-intense lesion (arrow)

Figure 4 (B): MRI (T2W image) of spine showing Inhomogeneous hyper-intense lesion (arrow)

Case-III:

A female of 32 years old presented with low back pain, low grade fever for nine months, weakness of both lower limbs for three months and inability to walk for 21 days. Weight loss was not reported. There was tenderness at lower dorsal spine. In both lower limbs, muscle power was reduced to 3 of 5; all jerks were exaggerated with extensor planter response, and diminished pain sensation from T_{10} to downwards. Her Haemoglobin-10.8 gm/dl of blood and ESR was 33 mm in 1st hour. Tuberculin skin test showed induration 16 mm at 72 hours. X-ray spine showed disc space reduction between T_{11}/T_{12} (Figure 5).

MRI of dorsal spine revealed opposing end plate of T_{11} and T_{12} with their intervening discs T_{11}/T_{12} associated with anterior bilateral paraspinal soft tissue swelling along with collection markedly compressing thecal sac, stenosis of spinal canal and obliterating neural foramen at the site leading to compression of dorsal cord and traversing nerve root (Figure 6 A, B).

Figure 5:

Figure 6: (A) T1W

Figure 6: (B) T2W

Figure 5: X-ray of lumbo-sacral spine (both view)

Figure 6 (A): T1 image of spine showing Inhomogeneous hypo-intense lesion (arrow)

Figure 6 (B): T2 image of spine showing Inhomogeneous hyper-intense lesion (arrow)

Case-IV:
A female of 50 years old presented with low back pain, intermittent low grade evening fever, loss of appetite and weight loss for five months. She had kyphosis but no neurological deficit. Her Haemoglobin-10.9 gm/dl of blood and ESR was 59 mm in 1st hour. Tuberculin skin test showed induration 20 mm at 72 hours. X-ray dorsal spine showed compressed fracture at T_8 (Figure 7).
MRI of dorsal spine revealed infective spondylodiscitis involving T_8/ T_9 vertebra with collapse of T_8 vertebra and abscess formation (Figure 8 A, B).

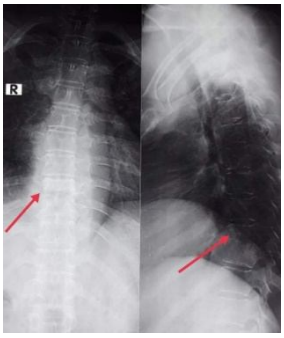
Figure 7:

Figure 8: (A) T1W

Figure 8: (B) T2W

Figure 7: X-ray of Dorsal spine (both view)
Figure 8 (A): T1 image of spine showing Inhomogeneous hypo-intense lesion (arrow)
Figure 8 (B): T2 image of spine showing Inhomogeneous hyper-intense lesion (arrow)

In all the patients, total blood count, X-rays Chest P/A view and Ultrasonography of Abdomen revealed normal except Ultrasonography of Abdomen in case-I, revealed psoas abscess. All the patients were advised to take anti-tubercular drugs for one year. All the patients were treated with anti-tubercular chemotherapy (Category I) with combination of rifampicin, isoniazid, pyrazinamide and ethambutol for initial two months and then rifampicin and isoniazid for subsequent months.
The patient of pott's disease with psoas abscess (Case-I) was treated with ultrasound guided aspiration of pus about 300 ml initially. On follow up after one month, the size of psoas abscess was not reduced, so open surgical drainage of psoas abscess with biopsy from abscess wall was done. Histopathological report showed granulomatous lesion consistent with tuberculosis. Her post-operative recovery was good, with no sinus or fistula formation. No surgical intervention was needed for other three cases. On subsequent follow up, all the four cases were well responded to anti-tubercular drugs in the form of reduction of back pain, fever subsided, weight gained and able to walk with support.

DISCUSSION

The spine is the most common site for tuberculosis (TB) of bone (Pott's disease)[1] and accounts for 50% cases of skeletal TB[4] and mainly involves the dorsal and dorso-lumbar regions[1,10] as these found in our cases.
Pott's disease is most frequently seen in first three decades of life. Commonly, in tuberculous spondylitis, the symptoms develop insidiously due to the slow progression of the disease, contributing to a significant delay between symptoms onset and diagnosis. Back pain is the most common symptom (83-100% of the patients), and constitutional symptoms, including fever, are relatively rare (33%).[11] Psoas abscess is more common in males than females.[12]
There are two types of psoas abscess, primary and secondary, depending on the underlying cause. Primary psoas abscess usually results from an occult source via lymphatic or hematogenous spread[13] in especially immunocompromised patients. Secondary psoas abscess results from local extension from infective focus in close proximity of the psoas muscle. Several studies[5,14] revealed, the most common cause of secondary psoas abscess is considered to be Crohn's disease.

In case-I, the psoas abscess is secondary type. The presentation of psoas abscess was usually non-specific. This leads to delay in diagnosis. The classical triad of presentation is fever, flank pain and limitation of hip movements found only in 35% cases.[14] Chronic progressive back pain with or without associated muscle spasms may prompt the diagnosis. In this study, low back pain, low grade evening fever, weight loss were the common presentations. In general, laboratory testing is non-specific. ESR and C-reactive protein are generally elevated and may be useful.[15] Diagnostic suspicion of tuberculous spondylitis is based on clinical and radiological features.

Spinal radiography may showed a destructive process of vertebras and adjacent discs if osteomyelitis is present. In these cases, X-ray Chest was normal indicating no pulmonary TB. X-ray Spine showed loss of lumbar lordosis, mild scoliosis of lumbar spine with reduced disc spaces between L3/L4 (Case-I), there were reduced disc space only (Case-II, III) and compressed fracture at T_8 vertebra (Case-IV). Ultrasonography of abdomen revealed psoas abscess (Case-I). Ultrasonographically this type of finding found in about 60% cases.[16] Computed tomography (CT)should be done for definitive diagnosis and is considered the gold standard.[17] CT scan of abdomen revealed paraspinal soft tissue swelling and psoas abscess formation (Case-I). Some authors believe that MRI is superior to CT scan[18] in few conditions like MRI gives better delineation of soft tissues and abscess, evaluation of spinal pathology and can also differentiate between tuberculous and pyogenic abscess. MRI was done in all the cases. Ziehl–Neelsen staining of aspirated pus from abscess, Acid Fast Bacilli usually not found.[19] Diagnosis can be based on culture which gives positive results in 50-75% cases. Fine needle aspiration cytology (FNAC)is simple and safe outpatient procedure for diagnosing pott's disease. Histopathological report showed granulomatous lesion consistent with tuberculosis (Case-I).

Treatment of pott's spine is the combined care of physician, surgeon, orthopedician and neurosurgeon. Anti-tubercular drugs are the foundation of treatment. Dass et al.[20] showed improvement of pott's disease with anti-tubercular drug. The standard is a combination of isoniazid, rifampicin, and pyrazinamide, with or without ethambutol. Anti-tubercular drugs should be given at least for one year with or without rest of spine with plaster jacket.

Surgery is reserved for unacceptable complications such as paraplegia, kyphosis or psoas abscess. Surgical options are drainage (percutaneous or open surgical) of psoas abscess or costotransversectomy with removal of all caseating material with bone grafting or posterior spinal fusion etc.[21,22] Goni et al.[4] showed significant improvement by percutaneous drainage of psoas abscess with anti-tubercular drugs but we experienced improvement in open surgical drainage with anti-tubercular drugs. Other three cases were well responded to only anti-tubercular drugs.

CONCLUSION

Extra pulmonary tuberculosis is one of the common disease in our country. The diagnosis of Pott's disease with or without psoas abscess may be considered in patient who had chronic back pain, low grade fever with weight loss. MRI is the most valuable method for detecting the early pott's disease. Early diagnosis and treatment of such disease can prevent the significant morbidity and mortality.

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Conflict of interest: None

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1. World Health Organization (WHO). WHO Recommendations: Low Birth Weight: preventing and managing the Global Epidemic. Geneva, Switzerland: WHO, 2000 (Technical Report Series no.894)
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Tables:

Each Table must be typed on a separate page. The table number should be followed by a Roman brief informative title. Provide explanatory matter in footnotes. For footnotes use symbol in this sequence; *, **, +, ++, etc.

Figures:

Line drawings, photomicrographs, colour prints and halftones should be camera ready, good quality prints. Submit only originals of laser prints, not photocopies. Original figures must be submitted indicating figure number, short figure title on top of figure lightly in pencil. Any abbreviations or symbols used in the figures must be defined in the figure or figure Legend.

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