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CONTENTS

January 2020

Editorial

- Covid-19 Pandemic: Still an unpredictable crisis** 1
Prof. Syed Mahmudul Aziz, Professor of Community Medicine, JIMC

Original Articles

- Electrolyte changes following phototherapy in neonatal Hyperbilirubinemia** 3
Ghosh UK, Parvin R, Sultana A, Rahman S, Afroze S, Haque MF
- A study on selective socio-demographic characteristics of patients of Enteric Fever in a tertiary care Hospital in Bangladesh** 14
Alam SM, Sultana T, Chowdhury AR, Amin RM, Kahhar MA
- Serum vitamin B 12 level in vitiligo patients: A case control study** 21
Sumi MN, Akter QS, Rahman H
- Effectiveness of topical tacrolimus(0.01%)in Treatment of vitiligo** 26
Roy P, Paul PC, Haque MM, Ajmery S
- Comparison of performance of Glasgow, BISAP & Ranson scores in Predicting Severity of Acute Pancreatitis** 31
Saqeb KMN

Case Reports

- Woolly hair-A rare entity** 40
Islam MS, Rikabder MMR, Hossain MI, Asgar N, Kabir MH, Biswas BP, Ahmed MNU
- Infantile Psoriasis: A Case Report** 43
Ahmed SS, Haque MM, Yousuf B, Ahmed SS, Islam M

Instructions to Author

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Editorial

Covid-19 Pandemic: Still an unpredictable crisis

Prof. Syed Mahmudul Aziz, Professor of Community Medicine, JIMC

** For Correspondence*

World health organization announced Covid-19 as a Pandemic on 11 March, 2020. At that time more than 20,000 cases and 1,000 deaths were found in different countries specially in Europe¹. After that the infection rapidly spread to other countries involving 215 countries & regions.

Started from Wuhan city of Hubei province of China at the end of December'2019, this Coronavirus infection (Known as Novel Coronavirous-2019) spread to the whole province rapidly and subsequently transmitted to other countries. The condition became worsening day by day making havoc by causing huge transmission and high death rate.

Before going to actual discussion in brief about Corona virus infection it can be mentioned that common symptoms are Fever, Dry Cough, Fatigue, less common are body ache, Sore Throat, Diarrhea, loss of taste or smell, skin discoloration or rash. Most symptoms are usually mild or even asymptomatic most people (about 80%) recovers without hospital treatment (WHO). Around 1 out of 5 Covid-19 patients's become moderate to seriously ill with breathing difficulties. Older people with co morbidity like hypertension, diabetes, cancer, lung, heart problems are at high risk of developing serious illness & need medical attention immediately².

Some new information say that though the Virus mainly affects lungs & respiratory tract, recently evidence is found to involve Liver, Kidney, Heart, Brain & other organs. Another finding is that it may cause blood coagulation problem in severe cases that may result in DIC, embolism & sudden death³.

It has been observed by the doctors & scientists that Covid-19 patient with breathing problem show good response with oxygen and antiviral drugs if given early when oxygen saturation tends to fall. High flow oxygen can give better result & use of ventilators may be reduced.

Till now it is continuing in 215 countries & regions but some countries are experiencing devastating situations. Contrive like USA, Brazil, Russia, India, Uk, Spain, Peru, Chilli, Italy, Iran are among top ten according to number of cases & death rate. At present countries of the world having total cases of 1,34,87,588 and 5,81,972 deaths as of 16 July 2020 .

The pandemic though started later in South East Asian countries but now increasing number of cases & deaths are being recorded every day. The other countries in includes India, Pakistan, Bangladesh, Afghanistan, Nepal, Maldives, Srilanka & Bhutan. In India now situation is worse & ranking 3rd position at the moment⁴.

Bangladesh is also now experiencing dangerous situation as cases & deaths are increasing every day. As of 16 July,2020 about 1,93,590 cases & 2,457 deaths are announced officially⁴.

For prevention & control already WHO given some guide lines from the beginning & updating time to time. According to WHO there is no alternative for quick case detection by tests and contact tracing of the Covid-19 position cases. Apart form that for prevention of person to person transmission effective measures have been advocated such as wearing of masks, regular washing of hands with soap & water using proper sanitizers, keeping adequate social distance, avoiding gathering etc are the key approaches. Restrictions of movements, timely lockdown when required are also very important and effective as found in many countries who were able to control Covid-19 spread such as South Korea, New Zealand, Sweden etc. Awareness and people's participation with appropriate decision play significant role in prevention & control of Covid-19 pandemic.

Scientists are engaged day & night world wide in search of effective medicines, treatment protocols as well as vaccines that can protect people. Drugs like Remdisivir, Dexamethasone are showing good result in treatment (WHO).

Trials of vaccines are going on world wide. University of oxford and Moderna of USA are ahead at this moment of the top 9 pharmaceuticals companies and are in phase III trial. (webmd.com) Many others research institutes are in progress⁵.

Already 6 months have been elapsed since beginning of Covid-19. But in spite of tremendous efforts from health agencies all over the world, still it is continuing and causing serious devastating conditions in some countries. Number of Covid-19 infected person exceeded more than 13 million and deaths more than half a million.

WHO warned that in the coming days we may have to face the worst days of Covid-19 pandemic as stated by Director General Mr. Tedros Adhanom Ghebreyesus in a briefing on June 29th 2020 (WHO). He also stated that we are far away from significant reduction of transmission though some countries have achieved some developments. He urged that we have to work more vigorously with patience, politeness & liberty. He emphasized five areas such as empowerment of people, reduction of transmission of infection, saving life by effective curative measures, research enhancement & proper political leadership⁶.

During this pandemic world is experiencing severe disruption of normal social life. Economy, income, livelihood, education are seriously affected specially in developing countries.

People should strictly maintain the health rules for prevention of infection. Governments must take all the effective measures for testing, treatment, contact tracing, promote research for drugs & vaccines, and help distressed people & families.

World is eagerly waiting to see the discovery of an effective vaccine that would be widely available and give people a peaceful safe life.

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Electrolyte Changes Following Phototherapy In Neonatal Hyperbilirubinemia

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Abstract

Background: Neonatal Hyperbilirubinaemia (NH) is common in newborns. Phototherapy plays a significant role in treatment of hyperbilirubinemia. Neonates receiving phototherapy may have electrolyte changes along with others side effect. Hypocalcaemia occurs following phototherapy but very few studies exists regarding other electrolytes like sodium, potassium and chloride changes.

Objective: To determine the serum electrolyte changes following phototherapy in neonatal hyperbilirubinaemia.

Methodology: This prospective comparative observational study was conducted in the department of Neonatology (SCANU) at Dr. M R Khan Shishu Hospital & ICH, Mirpur-2, Dhaka from September 2018 to May 2019 among 54 purposively selected neonates with uncomplicated hyperbilirubinemia. Neonates receiving phototherapy serum bilirubin and serum electrolytes were determined before and after ending of phototherapy. Data were collected using a preform data collection sheet. The first samples were considered as controls. A comparative analysis was made between before and after receiving phototherapy neonates to determine the incidence of electrolyte changes.

Results: Fifty four neonates were treated with phototherapy. Male: Female ratio was 1.35:1. Incidence of low birth weight neonates was 44% and preterm was 56%. Mean birth weight and gestational age was 2.66 ± 0.57 kg and 36.46 ± 1.87 weeks respectively. Mean duration of phototherapy was 72 ± 17.78 hours. The incidence of hyponatremia after phototherapy found to be 57.4% which was more in LBW neonates (87%, $p < 0.001$) and preterm neonates (70%, $p < 0.001$) than in normal birth weight neonates (37.9%) and term neonates (45.5%). Here the decreased level of mean serum total bilirubin, sodium, potassium and chloride found to be statistically significant. Hyponatremic preterm neonates and LBW neonates were asymptomatic clinically as mild hyponatremia (130-134 mmol/L) occurred. Hypokalemia and hypochloremia was found to be non-significant irrespective of birth weight and gestational age. The incidence of serum electrolyte changes after phototherapy was found to be non-significant irrespective of duration of phototherapy and mode of phototherapy.

Conclusion: The study shows that neonates receiving phototherapy are at a higher risk of electrolyte changes. Mild hyponatraemia were found significantly in preterm neonates and low birth weight neonates. No complication was seen due to hyponatraemia among that neonates. Hence this group of neonates should be closely monitored for changes in electrolytes and should be managed accordingly.

Key words: Neonatal Hyperbilirubinemia, Phototherapy, Electrolyte Changes

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Introduction

Neonatal Hyperbilirubinaemia (NH) is very common in newborns. It occurs due to excessive formation of unconjugated (indirect bilirubin) and inability of neonatal liver to rapidly clear it from blood. Phototherapy is the first and most common treatment for jaund

dice in newborns and in most cases is the only treatment required¹. Neonatal Hyperbilirubinaemia (NH), is the most common disorder, affecting neonates during the 1st week of life in approximately 60% of term infants and 80% of preterm infants^{2,3}. A commonly faced difficulty, neonatal hyperbilirubinemia by definition is rise in levels of total serum bilirubin more than

5 mg /dL or 86 μ mol / litre per day. Neonatal jaundice may be recognized in about 60% of infants born at full-term during first week. Hyperbilirubinemia in neonate's being a manifestation of undeveloped conduit of excretion of bilirubin by the liver. All neonates have some hyperbilirubinemia and most have benign outcomes when monitored and treated, if necessary, in a timely manner⁴. Neonatal Hyperbilirubinemia (NH) is the commonest abnormal physical finding during the first week of life. Neonatal Hyperbilirubinemia (NH) is the most common cause for readmission during the early neonatal period and is a cause of concern for the parents as well as for the pediatricians. Hence appropriate management of Neonatal Hyperbilirubinemia is of paramount importance. Phototherapy plays a significant role in treatment of hyperbilirubinemia. However, this treatment modality may itself result in inherent complications⁵. Elevated levels of unconjugated bilirubin can lead to bilirubin encephalopathy and subsequently kernicterus, with devastating permanent neurodevelopmental handicaps. Hence appropriate management of neonatal hyperbilirubinemia is of paramount importance⁶. Hyperbilirubinemia can be treated either by phototherapy or exchange transfusion or pharmacologic agents (Phenobarbitone, fibrates and albumin). Phototherapy plays a significant role in treatment of hyperbilirubinemia. The main demonstrated value of phototherapy is that it reduces the need for exchange transfusion. As any treatment has its side effects, phototherapy also has its adverse effects like hyperthermia and/or hypothermia, feed intolerance, loose stools, skin rashes, bronze baby syndrome, retinal changes, dehydration, hypocalcaemia, redistribution of blood flow and genotoxicity⁷. Unlike other side effects, a few studies are currently available that depicts the adverse effects of phototherapy on serum electrolytes. Hypocalcaemia is one of the known adverse effects;

Material and Methods

This was a prospective comparative observational study done at Department of Neonatology (SCANU), Dr. M R Khan Shishu Hospital & ICH, Mirpur-2 Dhaka from September 2018 to May 2019 after taking ethical clearance. Neonates with neonatal jaundice receiving phototherapy were study population where sample size was fifty four (N=54). All neonates both term and preterm (age 2nd to 14th day) with uncomplicated indirect hyperbilirubinemia and Jaundice lasting for 14 days or less than 14 days were included. Birth asphyxia, sepsis, renal failure, abnormal electrolytes

90% of preterm and 75% of full term neonates develop hypocalcaemia after being subjected to phototherapy⁸⁻¹¹. Prevalence of Phototherapy induced hypocalcaemia in term neonate is 56% after 48 hours of phototherapy¹². Serum calcium level decreased 43% in preterm and 56% in term neonates after 48 hours of phototherapy and stated symptomatic hypocalcaemia was more common in preterm¹³. Decrease in serum calcium during phototherapy results from trans cranial photic inhibition of melatonin synthesis¹⁴. Phototherapy inhibits pineal secretion of melatonin which blocks the effect of cortisol on bone calcium. So cortisol increases bone uptake of calcium and induces hypocalcaemia. Decreased secretion of parathyroid hormone as the cause of hypocalcaemia. Urinary calcium excretion was significantly higher in phototherapy group¹⁵. The differential effect on serum electrolytes with phototherapy has been studied by one researcher who stated that absorption of water, sodium chloride, and potassium was significantly impaired in the patients receiving phototherapy¹⁶. Phototherapy even for 72 hours does not significantly affect the fluid and electrolytes status of hyperbilirubinaemic infants fed with fairly high solute load meal formulas¹⁷. Among the side effect one of the side effects is diarrhea. Very small number of studies is currently in existence that depicts the side effects of phototherapy on the levels of electrolyte in serum. Since diarrhea causes change in electrolyte levels. Neonates receiving phototherapy have side effects like hypocalcaemia and electrolyte changes. Our study is hereby intended to observe the serum electrolyte changes due to phototherapy. In this study, we will determine the levels of serum sodium, potassium, chloride excluding bicarbonate and compare these levels before and after phototherapy in neonates with unconjugated hyperbilirubinemia.

findings before phototherapy, baby undergone exchange transfusion, jaundice lasting for more than 14 days, hemolytic anemia / Rh / ABO incompatibility, direct hyperbilirubinemia, congenital malformations, respiratory distress were excluded. Age, sex, gestational age, weight, serum sodium before & after phototherapy, serum potassium before & after phototherapy, serum chloride before & after phototherapy, serum total bilirubin before & after phototherapy, mode of phototherapy, duration of phototherapy were main variable. Detection of patients jaundiced neonates receiving phototherapy by following bilirubin chart and according to inclusion and exclusion criteria.

Eligible participants will be explained the study procedures in detail and written informed consent will be obtained from all patients' guardian/attendants.

A detailed history including maternal history, antenatal history, mode of delivery, immediate postnatal history, history of phototherapy in sibling, death of sibling, family history and congenital anomalies (as given by the patient's guardian/attendants) etc. will be recorded. Head to foot examination will be done.

Results

Among 54 babies, the majority 33 (61.1%) were within the range of 5 to 6 days of age, 9 (16.7%) were 2 to 4 days, 9 (16.7%) were 7 to 9 days and the rest 3 (5.6%) were between the age group of 10 to 11 days. The age of the babies ranged within 2 to 11 days and the mean age was 5.41 ± 1.98 SD.

More than half 31 (57.4%) were boys and the rest 23 (42.6%) were girls. Here, male to female ratio 1.35:1. The majority 30 (55.6%) were preterm (<37 weeks) and 24 (44.4%) were term (≥ 37 to 39 weeks). The gestational age of the neonates ranged within 32 to 39 weeks and the mean gestational age was 36.46 ± 1.87 SD.

Blood sample were collected. Serum electrolytes were checked at 0 hour (first sample) and at least 24 hours of phototherapy (second sample). The first samples were considered as control. Comparative study was made between these two samples groups to determine the changes in serum electrolytes. Other investigations were checked according to need. Statistical analysis done by using SPSS software V21. Chi square test done to see correlation or comperes. P value is significant when < 0.05 .

Thirty (55.6%) were born with a normal birth weight (2.5 to 4 kilogram) and 24 (44.4%) were low birth weight (<2.5 kilogram). The weight of the neonates ranged within 1.15 to 4 kilogram and the mean weight was 2.66 ± 0.57 SD.

Twenty nine (53.7%) had received conventional phototherapy and 25 (46.3%) had received LED phototherapy.

Thirty eight (70.4%) received phototherapy for more than 48 hours and the rest 16 (29.6%) had received phototherapy for up to 48 hours. The duration of phototherapy of the babies ranged within 48 to 96 hours and the mean duration of phototherapy was 72 ± 17.78 SD (Table I).

Table I : Distribution of study neonates by given variables (N=54)

| Variables | Number (n) | Percentage (%) | Mean± SD |
|--------------------------|------------|----------------|-------------|
| Age in days | | | |
| 2-4 | 9 | 16.7 | |
| 5-6 | 33 | 61.1 | 5.41± 1.98 |
| 7-9 | 9 | 16.7 | |
| 10-11 | 3 | 5.6 | |
| Sex | | | |
| Male | 31 | 57.4 | M:F 1.35:1 |
| Female | 23 | 42.6 | |
| Gestational Age | | | |
| Term | 24 | 44.4 | 36.46± 1.87 |
| Preterm | 30 | 55.6 | |
| Weight | | | |
| Normal | 30 | 55.6 | 2.66 ± 0.57 |
| LBW | 24 | 44.4 | |
| Mode of Phototherapy | | | |
| Conventional | 29 | 53.6 | |
| LED | 25 | 46.3 | |
| Duration of Phototherapy | | | |
| Up to 48 hours | 16 | 29.6 | 72 ± 17.78 |
| > 48 hours | 38 | 70.4 | |

The majority 31 (57.4%) had hyponatremia (130-134 mmol/L), 17 (31.5%) had normal serum sodium level(135-145mmol/L) and only 6 (11.1%) had hypernatremia (146-153 mmol/L) after phototherapy. The serum sodium level after phototherapy ranged from 130 to 153 mmol/L and the mean was 137.04 ± 6.48 SD. Twenty nine (53.7%) had normal serum potassium level(3.5-5.5 mmol/L), 22 (40.7%) had hypokalaemia(3.2-3.4mmol/L) and 3 (5.6%) had hyperkalaemia (5.6-6.0 mmol/L) after phototherapy. The serum potassium level after phototherapy ranged from 3.2 to 6.0 mmol/L and the mean was 3.67 ± 0.57 SD. Thirty six (66.7%) had hypochloremia (90 -96 mmol/L), 12 (22.2%) had normal serum chloride level(98-106 mmol/L) and only 6 (11.1%) had hyperchloremia (107-110mmol/L) after phototherapy. The serum chloride level ranged from 90 to 110 mmol/L and the mean was 97.36 ± 5.33 SD (Table II).

Table II: Serum electrolytes level of the study neonates after phototherapy (N=54)

| S. electrolytes (mmol/L) | Number (n) | Percentage (%) | Mean \pm SD |
|--------------------------|------------|----------------|-------------------|
| Sodium | | | |
| < 135 | 31 | 57.4 | |
| 135-145 | 17 | 31.5 | 137.04 \pm 6.48 |
| > 145 | 6 | 11.1 | |
| Potassium | | | |
| < 3.5 | 22 | 40.7 | |
| 3.5-5.5 | 29 | 53.7 | 3.67 \pm 0.57 |
| > 5.5 | 3 | 5.6 | |
| Chloride | | | |
| < 96 | 36 | 66.7 | |
| 96-106 | 12 | 22.2 | 97.36 \pm 5.33 |
| > 106 | 6 | 11.1 | |

The incidence of hyponatremia following phototherapy was more in low birth weight babies (87%) than in normal babies (37.9%). Thus it infers that low birth weight babies were at more risk of hyponatremia following phototherapy than normal weight babies. By chi-square test using, the p value obtained was <0.001. Thus, it is considered to be statistically significant. The incidence of potassium and chloride changes following phototherapy was found to be non-significant where $p > 0.05$ in both low birth weight babies and normal weight babies (Table III)

Table III: Correlation of serum electrolytes with birth weight (kg) after phototherapy (N=54)

| Attributes (mmol/L) | LBW n (%) | Normal Weight n (%) | Total n (%) | P value |
|---------------------|-----------|---------------------|-------------|----------|
| Sodium | | | | |
| < 135 | 20(87%) | 11(37.9%) | 31(57.4%) | |
| 135-145 | 3(13%) | 14(48.3%) | 17(31.5%) | P=0.001* |
| > 145 | 0(0%) | 6 (11.1%) | 6(11.1%) | |
| Potassium | | | | |
| < 3.5 | 13(56.5%) | 9 (31%) | 22(40.7%) | |
| 3.5-5.5 | 10(43.5%) | 19(65.5%) | 29(53.7%) | P=0.144 |
| > 5.5 | 0 (0%) | 3 (5.6%) | 3(5.6%) | |
| Chloride | | | | |
| < 96 | 19(82.6%) | 17(58.6%) | 36(66.7%) | |
| 96-106 | 4 (17.4%) | 8 (27.6%) | 12(22.2%) | P=0.09 |
| > 106 | 0 (0%) | 6 (11.1%) | 6(11.1%) | |

*Statistically Significant

The incidence of hyponatremia following phototherapy was more in preterm neonates (70%) than in term neonates (45.5%). Thus it infers that preterm babies were at more risk of hyponatremia following phototherapy than term babies. By chi-square test, using the p value obtained was <0.001, which was considered to be statistically significant. The incidence of potassium and chloride changes following phototherapy was found to be non-significant in both preterm and term neonates. (Table IV).

Table IV: Correlation of serum electrolytes with gestational age (weeks) after phototherapy (N=54)

| Attributes(mmol/L) | <37weeks n (%) | ≥37weeks n (%) | Total n (%) | P value |
|--------------------|----------------|----------------|-------------|----------|
| Sodium | | | | |
| < 135 | 21(70%) | 10(45.5%) | 31(57.4%) | |
| 135-145 | 9(30%) | 10(45.5%) | 19(35.2%) | P=0.032* |
| > 145 | 0(0%) | 4(18.2%) | 4(7.4%) | |
| potassium | | | | |
| < 3.5 | 14(46.7%) | 8 (36.4%) | 22(40.7%) | |
| 3.5-5.5 | 16(53.3%) | 15(68.2%) | 31(57.4%) | P=0.415 |
| > 5.5 | 0 (0%) | 1(4.5%) | 1(1.9%) | |
| Chloride | | | | |
| < 96 | 22(73.3%) | 14(63.6%) | 36(66.7%) | |
| 96-106 | 8(26.7%) | 6(27.3%) | 14(25.9%) | P=0.051 |
| > 106 | 0 (0%) | 4(18.2%) | 4(7.4%) | |

*Statistically significant

The incidence of hyponatremia was 63.2% when duration of phototherapy was >48hrs as compared to duration up to 48hours (50%). Thus it infers that babies were at no risk of hyponatremia if kept under phototherapy for more than 48hrs. By chi-square test using the p value obtained was 0.172, which was considered to be not statistically significant. The incidence of potassium and chloride imbalances was found to be non- significant with duration of phototherapy. (Table V).

Table V: Correlation of serum electrolytes with duration of phototherapy (hours) after phototherapy (N=54)

| Serum electrolytes (mmol/l) | Up to 48 hrsn (%) | >48 hrsn (%) | Total n (%) | P value |
|-----------------------------|-------------------|--------------|-------------|---------|
| Sodium | | | | |
| < 135 | 7(50%) | 24(63.2%) | 31(57.4%) | |
| 135-145 | 9(64.2%) | 10(26.3%) | 19(35.1%) | P=0.172 |
| > 145 | 0(0%) | 4 (10.5%) | 4(7.4%) | |
| Potassium | | | | |
| < 3.5 | 3(21.4%) | 19 (50%) | 22(40.7%) | |
| 3.5-5.5 | 13(92.9%) | 18(47.4%) | 31(57.4%) | P=0.127 |
| > 5.5 | 0 (0%) | 1(2.6%) | 1(1.9%) | |
| Chloride | | | | |
| < 96 | 11(78.6%) | 25(65.8%) | 36(66.7%) | |
| 96-106 | 5(35.7%) | 9(23.7%) | 14(25.9%) | P=0.419 |
| > 106 | 0 (0%) | 4(10.5%) | 4(7.4%) | |

The incidence of hyponatremia was 56% when mode of phototherapy was LED as compared to conventional (58.6%). Thus it infers that babies were at no risk of hyponatremia if kept under either LED or conventional phototherapy. By chi-square test using the p value obtained was 0.351, which was considered to be not statistically significant. The incidence of potassium and chloride imbalances was found to be non- significant with mode of phototherapy (Table VI).

Table VI: Correlation of serum electrolytes with mode of phototherapy after phototherapy (N=54)

| Serum electrolytes (mmol/l) | Conventional n (%) | LED n (%) | Total n (%) | P value |
|-----------------------------|--------------------|-----------|-------------|---------|
| Sodium | | | | |
| < 135 | 17(58.6%) | 14(56%) | 31(57.4%) | |
| 135-145 | 11(37.9%) | 8(32%) | 19(16.7%) | P=0.351 |
| > 145 | 1(3.4%) | 3 (12%) | 4(7.4%) | |
| potassium | | | | |
| < 3.5 | 10(34.5%) | 12(48%) | 22(40.7%) | |
| 3.5-5.5 | 19(65.5%) | 12(48%) | 31(57.4%) | P=0.189 |
| > 5.5 | 0 (0%) | 1(4%) | 1(1.9%) | |
| Chloride | | | | |
| < 96 | 22(75.9%) | 14(56%) | 36(66.7%) | |
| 96-106 | 6(20.7%) | 8(32%) | 14(25.9%) | P=0.419 |
| > 106 | 1(3.4%) | 3(12%) | 4(7.4%) | |

Overall, there was significant decline in mean serum sodium, potassium and chloride along with total bilirubin following phototherapy (Table VII).

Table VII: Comparative analysis of mean serum electrolytes & total bilirubin before and after phototherapy in study neonates

| Attributes (mmol/L) | Before Phototherapy (Mean±SD) | After Phototherapy (Mean±SD) | Difference | t value | P value |
|---------------------|-------------------------------|------------------------------|------------|---------|---------|
| Total Bilirubin | 17.09 ± 2.33 SD | 11.33±2.27 SD | 5.76 | -19.56 | 0.000* |
| Sodium | 141.58 ± 4.76 SD | 137.04 ± 6.48 SD | 4.54 | 4.709 | 0.000* |
| Potassium | 3.97 ± 0.48 SD | 3.67± 0.57 SD | 0.3 | 4.233 | 0.000* |
| Chloride | 99.52 ± 3.68 SD | 97.36 ± 5.33 SD | 2.16 | 2.770 | 0.008* |

*Statistically Significant

Discussion

Neonatal Hyperbilirubinemia (NH) is the commonest abnormal physical finding during the first week of life. Early discharge of healthy term newborns from the hospital after delivery has recently become a common practice for medical, social and economic reasons. However, it has been shown that newborns whose post-delivery hospital stay < 72 hours are at a significantly greater risk for readmission than those whose stay is >72 hours. Phototherapy has emerged as the most widely used form of treatment and is the current therapy of choice to reduce severity of neonatal unconjugated hyperbilirubinemia. As any treatment has its side effects, phototherapy also has. Few studies are currently available that depicts the adverse effects of phototherapy on serum electrolytes. A few studies in the recent past, have stressed on the incidence of hypocalcaemia following phototherapy and very few studies till date regarding the effect of phototherapy on all electrolytes. Hence our study was designed to determine the electrolyte changes in neonates receiving phototherapy for neonatal jaundice. Among 54 babies, the majority 33 (61.1%) were within the range of 5 to 6 days of age, 9 (16.7%) were 2 to 4 days, 9 (16.7%) were 7 to 9 days and the rest 3 (5.6%) were between the age group of 10 to 11 days. The age of the babies ranged within 2 to 11 days and the mean age was 5.41 ± 1.98 SD.

More than half 31 (57.4%) were boys and the rest 23 (42.6%) were girls. Here, male to female ratio 1.35:1.

This finding is supported by the findings of a study, which revealed that male to female ratio was 1.45:118. The majority 30 (55.6%) were preterm (32 to <37 weeks) and 24 (44.4%) were term (≥ 37 to 39 weeks). The gestational age of the neonates ranged within 32 to 39 weeks and the mean gestational age was 36.46 ± 1.87 SD. This also corresponds with the findings of another study which revealed that the mean gestational age was 38.44 ± 1.98 weeks and preterm was 20.2%¹⁸. Thirty (55.6%) were born with a normal birth weight (2.5 to 4 kilogram) and 24 (44.4%) were low birth weight (<2.5 kilogram). The weight of the neonates ranged within 1.15 to 4 kilogram and the mean weight was 2.66 ± 0.57 SD. This is also similar with the findings of another study which revealed that the incidence of low birth weight babies was 23% mean birth weight was 2.84 ± 0.51 kg¹⁸.

Twenty nine (53.7%) had received conventional phototherapy and 25 (46.3%) had received LED phototherapy. Thirty eight (70.4%) received phototherapy for more than 48 hours and the rest 16 (29.6%) had received phototherapy for up to 48 hours. The duration of phototherapy of the babies ranged within 48 to 96 hours and the mean duration of phototherapy was 72 ± 17.78 SD.

In this study found that among the 54 neonates, the majority 44 (81.5%) had serum total bilirubin level (15.01-20 mg/ dl),

5 (9.3%) had serum total bilirubin level (10-15 mg/dL) and 5 (9.3%) had serum total bilirubin level (20.01-25 mg/dl) before phototherapy. The serum total bilirubin level of the neonates ranged within 10 to 24.2 mg/dl and the mean serum total bilirubin level was 17.09 ± 2.33 SD. Among the study neonates, the majority 40 (74.1%) had serum indirect bilirubin level 15.01-20 mg/dl, 11 (20.4%) had serum indirect bilirubin level 11-15 mg/dl, and 3 (5.6%) had serum indirect bilirubin level 20.01-25 mg/dl before phototherapy. The serum indirect bilirubin level of the neonates ranged from 11 to 24 mg/dl and the mean serum indirect bilirubin level was 16.66 ± 1.98 SD. This corresponds with the finding of the study which revealed that the mean duration of phototherapy was 37.65 ± 11.06 hours which is in contrast to another study where it was 3 days^{18, 19}.

Thirty one (57.4%) had hyponatremia (130-134 mmol/L), 17 (31.5%) had normal serum sodium level (135-145 mmol/L) and only 6 (11.1%) had hypernatremia (146-153 mmol/L) after phototherapy in this study population. The serum sodium level after phototherapy ranged from 130 to 153 mmol/L and the mean serum sodium level after phototherapy was 137.04 ± 6.48 SD. This finding is supported by the findings of another study which revealed that the incidence of hyponatremia post phototherapy found to be 6%.¹⁸

The majority 29 (53.7%) had normal serum potassium level (3.5-5.5 mmol/L), 22 (40.7%) had hypokalemia (3.2-3.4 mmol/L) and 3 (5.6%) had hyperkalemia (5.6-6.0 mmol/L) after phototherapy. The serum potassium level after phototherapy ranged from 3.2 to 6.0 mmol/L and the mean serum potassium level after phototherapy was 3.67 ± 0.57 SD. The majority 36 (66.7%) had hypochloremia (90-95 mmol/L), 12 (22.2%) had normal serum chloride level (96-106 mmol/L) and only 6 (11.1%) had hyperchloremia (107-110 mmol/L) after phototherapy. The serum chloride level ranged from 90 to 110 mmol/L and the mean serum chloride level after phototherapy was 97.36 ± 5.33 SD. Thirty seven (68.5%) had serum total bilirubin level (10.01-15 mg/dl), 12 (22.2%) had serum total bilirubin level (5-10 mg/dl) and only 5 (9.3%) babies had serum total bilirubin level (15.01-20 mg/dl) after phototherapy in this study group. The serum total bilirubin level after phototherapy ranged within 7 to 20 mg/dl and the mean serum total bilirubin level after phototherapy was 11.33 ± 2.27 SD. There are very few studies regarding mechanism of phototherapy induced electrolyte changes. A study which stated that absorption of water, sodium chloride, and potassium was significantly impaired in the patients receiving phototherapy²⁰.

The incidence of hyponatremia following phototherapy was more in low birth weight babies (87%) than in normal babies (37.9%). Thus it infers that low birth weight babies were at more risk of hyponatremia following phototherapy than normal weight babies. By chi-square test using, the p value obtained was <0.001 . Thus, it is considered to be statistically significant. The incidence of potassium and chloride changes following phototherapy was found to be non-significant where $p > 0.05$ in both low birth weight babies and normal weight babies. This also corresponds with the findings of the study which revealed that the hyponatremia following phototherapy was also more in low birth weight babies (17.2%) than in normal babies (2.6%). So low birth weight babies were at more risk of hyponatremia following phototherapy than term babies. Potassium and chloride changes following phototherapy was found to be non-significant in both low birth weight babies and normal babies⁵.

Incidence of hyponatremia after phototherapy was more in preterm neonates (70%) than in term neonates (45.5%). Thus it infers that preterm babies were at more risk of hyponatremia following phototherapy than term babies. By chi-square test, using the p value obtained was <0.001 , which was considered to be statistically significant. The incidence of potassium and chloride changes following phototherapy was found to be non-significant in both preterm and term neonates. This also corresponds with the findings of a study which revealed that hyponatremia following phototherapy was more in preterm neonates (17.6%) than in term neonates (3.1%). Thus preterm babies were at more risk of hyponatremia following phototherapy than term babies. Potassium and chloride changes following phototherapy was found to be non-significant in both preterm and term neonates⁵.

The incidence of hyponatremia was 63.2% when duration of phototherapy was >48 hrs as compared to duration up to 48 hours (50%). Thus it infers that babies were at no risk of hyponatremia if kept under phototherapy for more than 48 hours. By chi-square test using the p value obtained was 0.172, which was considered to be not statistically significant. The incidence of potassium and chloride imbalances was found to be non-significant with duration of phototherapy. This result not corresponds with the findings of a study which revealed that the hyponatremia was 17.4% when duration of phototherapy was >48 hrs as compared to duration <48 hrs (1.6%).

Thus it infers that babies were at higher risk of hyponatremia if kept under phototherapy for more than 48 hours. By chi-square test, using test for paired sample means, the p value obtained was <0.001 , which was considered to be statistically significant. The incidence of potassium and chloride imbalances was found to be non-significant with duration of phototherapy⁵.

The incidence of hyponatremia was 56% when mode of phototherapy was LED as compared to conventional (58.6%). Thus it infers that babies were at no risk of hyponatremia if kept under either LED or conventional phototherapy. By chi-square test using the p value obtained was 0.351, which was considered to be not statistically significant. The incidence of potassium and chloride imbalances was found to be non-significant with mode of phototherapy.

The mean total bilirubin of the respondents before phototherapy (17.09 ± 2.33 SD) was higher than the mean serum total bilirubin of the respondents after phototherapy (11.33 ± 2.27 SD), mean serum sodium before phototherapy (141.58 ± 4.76 SD) was higher than the mean serum sodium after phototherapy (137.04 ± 6.48 SD), mean serum potassium before phototherapy (3.97 ± 0.48 SD) was higher than the mean serum potassium after phototherapy (3.67 ± 0.57 SD), mean serum chloride before phototherapy (99.52 ± 3.68 SD) was higher than the mean serum chloride after phototherapy (97.36 ± 5.33 SD). The difference was statistically significant, ($p < 0.05$). This also corresponds with the findings of a study which revealed that mean serum sodium and total bilirubin levels were significantly decreased after phototherapy. As the P value <0.001 , this difference is considered to be statistically significant but in our study mean serum potassium and chloride also decreased which is contradictory⁵.

In our study incidence of hyponatremia was 57.4% and was higher in preterm (70%) and low birth weight babies (87%) than in term (45.5%) and normal weight babies (37.9%). Hyponatremia following phototherapy was similar when the duration of phototherapy more than 48 hours when compared to less than 48 hours and also when compared between conventional with LED phototherapy. Mean Serum total bilirubin, sodium, potassium and chloride levels were significantly decreased after phototherapy.

This study corresponds mostly but some variables are contradictory to a study done abroad; whereas incidence of hyponatremia is 6% and is higher in preterm (17.6%) and low birth weight babies (17.2%)

than in >37 weeks group (3.1%) and normal weight babies (2.6%). Incidence of hyponatremia following phototherapy is higher when the duration of phototherapy is more than 48 hours when compared to less than 48 hours. Mean Serum sodium levels were significantly decreased after phototherapy. There are no significant changes in potassium and chloride levels following phototherapy⁵. Another study showed that neonates under phototherapy are at higher risk of hyponatremia and hypokalemia. This risk was greater in premature and LBW babies which is similar to our study²¹.

Conclusion

The study shows that neonates receiving phototherapy are at a higher risk of electrolytes changes. Hyponatraemia, hypokalemia and hypochloremia were found in following phototherapy where Hyponatraemia were significantly observed in preterm neonates and low birth weight neonates. Duration of phototherapy and mode of phototherapy did not have any significant effect on electrolytes changes. No complication was seen due to dyselectrolytemia as mild changes occurred. Hence this group of neonates should be closely monitored for changes in electrolytes and should be managed accordingly. Here, we want to mention that hyponatremia may be found in preterm and low birth weight neonates due to their prematurity and poor renal handling of electrolytes. So, further more study recommended with a large number of preterm neonates and low birth weight neonates in multiple center.

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Original Article***A study on selective socio-demographic characteristics of patients of Enteric Fever in a tertiary care Hospital in Bangladesh*****Alam SM,¹ Sultana T², Chowdhury AR³, Amin RM⁴, Kahhar MA⁵**

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Abstract

Background: Enteric fever is endemic in many parts of the third world countries including Bangladesh. It is both a water-born and food-born infection. Lack of sanitation, access to safe drinking water and personal hygiene is reported as risk factors for enteric fever infection. However, our scenario is not well studied. The study was conducted at a tertiary hospital where mostly poor and middle income groups visit. Also as Dhaka is capital of Bangladesh, this tertiary hospital has referral from all over the country and such it is representative of picture of entire country.

Material and Methods: This hospital based observational study was carried out among in patients and out patients of department of medicine at Dhaka Medical College and Hospital from May to October 2010. Patients were selected on the basis of availability. Patients of ages 16 onward of both sexes were selected. Fifty culture proven patients of enteric fever were enrolled. Demographic profile and risk factors of enteric fever (Maintenance of Personal hygiene, sanitation, food and drinks habits) were especially observed.

Results: A series of 50 patient of culture proven enteric fever, age between 16-60 years, were collected from all units of Medicine department (in patient and out patient) and analyzed regarding the socio-demographic profile and frequency, poor sanitation, lack access to clean drinking water or contaminated foods from street vendors among the cases of enteric fever. Among 50 cases of enteric fever 46 cases, were *Salmonella typhi*, only 4 cases were *Salmonella paratyphi*. In this study it was observed that 88% cases were below 30 years of age group with male to female ratio (1:1.1). It was observed nearly two third (66.0%) of the patients came from urban area, 9(18.0%) came from sub-urban/slum area and rest 8(16.0%) from rural area. Regarding education it was observed that majority (42%) of the patient had primary level of education and from lower class. Garments workers (26%) and students (24%) were observed to be affected more. Following independent variable were observed with incidence of enteric fever: Consumption of uncooked vegetable like salad (42% case), Consumption of poor quality drinking water (70% case), and lack of personal hygiene, hand washing before meal 17 cases (34%).

Conclusion: It was observed that poor sanitation and hygiene together with the absence of safe drinking water had high prevalence of this food and water born disease.

Key words: Enteric fever, Risk factors, Socio-Demographic profile.

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Introduction

Enteric fever is the most common febrile illnesses encountered by the physicians in Bangladesh. Enteric Fever (typhoid and paratyphoid) caused by *Salmonella enterica* serovar *typhi* (S. *typhi*) or serovar *paratyphi* A,

B, C represents a major burden of disease in the communities, due to lack of pure water and adequate sanitation. More than 27 million case of enteric fever occur world wide in each year with 216000 deaths¹. The incidence is highest (>100 cases per 100,000 population per year) in south central and south-east Asia¹,

² medium in the rest of the Asia, Africa, Latin America and some part of Oceania and low in the rest of the world. It is more common among young children and adolescents (2-15 years) and in the urban than rural area. S. Typhi represents the commonest cause of bacteraemia in this age group and annual typhoid rates (confirmed by blood culture) ^{3, 4}. The incidence of bacteraemic typhoid fever in Bangladesh per year was found 390/100,000 in 2004. ⁵ Because human is the only natural reservoir of *Salmonella typhi*, direct or indirect contact with an infected person (sick or chronic carrier) is necessary for infection. Ingestion of food or water contaminated with human feces is the most common mode of transmission. Water borne outbreaks due to poor sanitation and direct fecal-oral spread are encountered mainly in developing countries. With improvement of food handling and water /sewage treatment, World Health Organization (WHO) conservatively estimates the annual global incidence of typhoid fever at 0.3%. In some developing countries of Asia and Africa the annual incidence may reach 1% with case fatality rate as high as 10%. About 70% of all fatalities from typhoid fever occur in Asia. If the factors of enteric fever (where there is neither safe water supply nor adequate sanitation, enteric fever patients or carriers excreting *Salmonella*. Carriers such as food handlers are an important source of transmission. can be observed it will enable the physician of all level to take a good decision for prevention of enteric fever. A high incidence of enteric fever correlates with poor sanitation and lack of access to clean drinking water. In endemic regions, enteric fever is more common in urban than rural areas and among young children and adolescents ⁵.

General Objectives: Selective demographic study of enteric fever in a tertiary care hospital (DMCH).

Specific Objectives:

- To show the relation of poor sanitation and lack of access to clean drinking water with the incidence of enteric fever.
- To show relation between dietary habit and maintenance of personal hygiene before developing typhoid fever.
- To assess the socio-economic characteristics of the patients.

Materials & Methods

This Hospital based observational study, done in Dhaka Medical College Hospital.

Study Population: Patients (Both male and female aged 16-60 years. Admitted and attend outpatient Medicine department

Data collection: All data were collected by using a preformed data sheet (CRF - Case record form).

Inclusion criteria:

- Fever for more than 5 days with culture positive *Salmonella typhi* or paratyphi
- One or more of the following signs: abdominal pain, nausea, vomiting, diarrhoea, headache, splenomegaly, hepatomegaly or rose-spot.
- Provides informed consent. Age between 16 to 60 years.

Exclusion criteria:

- Person not giving informed consent.
- Patient taking antibiotic (sensitive for enteric fever) within last 4 days of screening for enrollment

Study Procedure: Patients presented in Medicine outpatient department and admitted in indoor were selected for enrollment. Individuals fulfilling the inclusion criteria were enrolled in the study. Informed consent was obtained accordingly. Those who were suspected to have enteric fever were treated by the concerned physician working in outdoor and indoor accordingly.

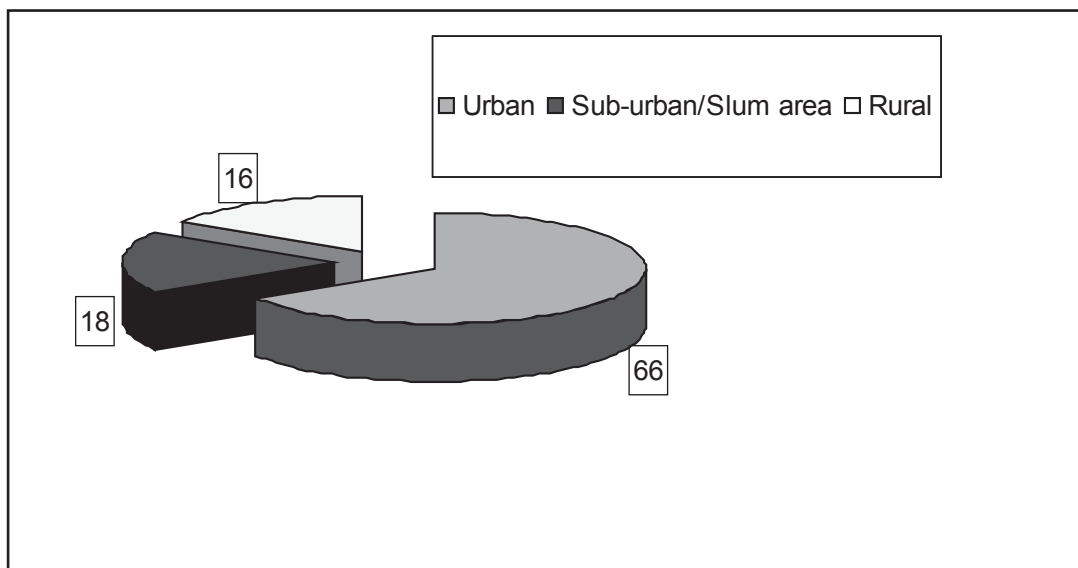
For indoor patients, blood was collected by the investigator and for outdoor cases, the patient was sent to the microbiology department of DMCH for blood culture and sensitivity. Blood sample was collected before giving any antibiotic. Collected sample was initially cultured in automated blood culture machine for 24 hours. Then subcultured in MacConkey agar plate aerobically overnight for *Salmonella typhi* or paratyphi.

Results

Table I : Age, sex marital status. (n=50)

| Age in years | Number of cases(%) | Mean±SD | Range(min-max) |
|------------------|--------------------|---------------------|----------------|
| 16- 20 | 20(40) | 25.6±15.7 | (16-60) |
| 21-30 | 24(48) | | |
| 31-40 | 3(6) | | |
| 41-50 | 2(4) | | |
| 51- 60 | 1(2) | | |
| Sex distribution | | Number of cases (%) | |
| Male | | 24 (48) | |
| Female | | 26 (52) | |
| Marital status | | | |
| Married | | 15 (30) | |
| Unmarried | | 35 (70) | |

Table I shows the study patients were divided into five age groups. The mean (\pm SD) age was 25.6 ± 15.7 years with ranged from 16 to 60 years and maximum number (48.0%) of patients was found in the age group of 21-30 years. Regarding sex distribution of the study patients it was found that more than a half (52.0%) of the patients were female and 24 (48.0%) were the male, regarding the marital status most of the patients were unmarried (70% cases).



Pie Diagram: Rural and Urban distribution of the study patients (n=50)

The pie diagram showed nearly two third (66.0%) of the patients came from urban area, 9(18.0%) came from sub-urban/slum area and rest 8(16.0%) from rural area.

Table II: Socio-demographic characteristics of study population (n=50)

| Factors | Number of cases(%) |
|---------------------------------------------------|---------------------------|
| Occupational status | |
| Garments worker | 13(26) |
| Student | 12(24) |
| House wife | 7(14) |
| Worker/day laborer | 8(16) |
| Service | 5(10) |
| Businessmen | 5(10) |
| Educational status | |
| Illiterate (never gone to school) | 9(18) |
| Primary (up to 5 years school) | 21(42) |
| Secondary | 18(36) |
| Graduate | 2(4) |
| Socio-economic class as per monthly income | |
| Lower | 22(44.) |
| Middle | 20(40) |
| Upper | 8(16) |

Low income: <5,000 per month

Low-middle class group: 5,000-<20,000

Upper-middle class group: 20,000-<60,000

High income >60,000

Table II shows the socio-demographic characteristics of study population most of the patients were Garments workers (26.0%) and Student (24.0%). Others occupation are depicted in the above table. Regarding the education level it was observed that majority (42.0%) the patients had primary level, 18 cases (36%) had secondary, 2 cases (4%) were graduate and only 9 cases (18%) were illiterate. Most cases (44%) of the patients came from lower socio-economic class family, 20 cases(40%) from middle class and rest 8(16%) from upper class family. The class of family were determined through the above reference.

Table III: Sanitation, Personal hygiene & source of drinking water

| Sanitation facilities | Percentage (%) |
|-------------------------------------------------|-----------------------|
| Sanitary latrine | 41(82) |
| Kachha latrine | 6(12) |
| Open field | 3(6) |
| Hand washing before meal with soap | 17(34) |
| Hand washing with soap after defecation | 33(66) |
| Source of drinking water | |
| Supply from WASA (Water and Sewerage Authority) | 35(70) |
| Tube well water | 12(24) |
| Ponds/River Water | 1(2) |
| Ice and drinks from vendors | 2(4) |

Table III shows the personal hygiene, that hand washing before meal was observed 17(34%) and hand washing after defecation was 33(66%) of the study patients, most cases 35(70.%) of the study patients used supply water from WASA, 12(24%) cases used tube well water, 2(4%) cases used Ice and drinks from street vendors and 1(2%) cases used ponds/river water.

Table IV: Distribution of study patients according to dietary history, 4 weeks before illness

| Dietary history | Number of cases(%) |
|---------------------------------------|---------------------------|
| Egg (pouched/unhygienically prepared) | 9(18) |
| Uncooked vegetables (Salad) | 21(42) |
| Fruits | 10(20) |
| Fish or vegetables (Growing sewerage) | 5(10) |
| Food and Drinks from street vendors | 5(10) |

Table IV, shows regarding the dietary history it was observed that egg, vegetable, salad and Fruits (Raw) were more common food items of the study patients.

Table V: Symptoms & Sign

| Symptoms recorded | | Number of cases(%) |
|-------------------|-----------------|--------------------------------------|
| Fever | | 49(98) |
| Pain abdomen | | 27(54) |
| Headache | | 22(44) |
| Vomiting | | 10(20) |
| Loose motion | | 7(14) |
| Signs recorded | Mean \pm SD | Range (min – max) |
| Pulse | 71.3 \pm 13.4 | 57-104 |
| Temperature | 101.2 \pm 3.1 | 99 ⁰ F-106 ⁰ F |
| | (n=50) | percentage |
| Coated tongue | | 17(34) |
| Splenomegaly | | 4(8) |
| Hepatomegaly | | 1(2) |
| | | |
| | | |

Table V shows, Regarding the symptoms recorded it was observed that fever, pain abdomen, headache and loose motion were more common symptoms of the study patients.

Discussion

The diseases is present especially in areas where health facilities are limited and peoples are illiterate, living in unhygienic surroundings, drink raw water from tube well and not habituated of hand washing after toilet by soap. In this present study common age group of enteric fever 21-30 years. The result is comparable to other study done in India ⁶ and Nepal ⁷.

The socio-demographic characteristics of study population are the gender difference in the incidence of typhoid fever. More than fifty percent (52%) were female and 48% were male. Similar observation shows in other studies done in India ⁶, Nepal ⁷.

In this study, observed that people of almost all occupation are susceptible to enteric fever. This is similar to the findings of other study ^{8,10} in this study Garments worker (26%) affected maximum, next group were student (24%). Garments worker and students were affected as

they often took food from street vendors more commonly. This is similar to other study done in India¹¹. In this study it was observe maximum (42%) patients had education of primary level. It is similar to study done by vollard et al ⁸. Studied shows that people of almost all social class were susceptible to develop enteric fever. In this study most of the patients (44%) comes from lower socio economic class. The result is similar to other study done in ICDDR ^{9,10}.

In this study more than fifty percent patient (66%) came from urban area and (18%) from slum area and only (16%) from rural area. The result is similar to study done by ICDDR (in Kamlapur Dhaka 2001). ^{9,12} The less representation of rural area may be because of inability of patients to take tertiary care service due to distance or lack of transport accessibility. Regarding the dietary history it was observed that patient taking eggs (pouched/prepared by contaminated hand, (18%) and fruits (20%) and salads,

uncooked vegetables (42%) similar to study conducted in cities in Indonesia, Chile and Pakistan reported that eating and drinking outside 'Food and drinks from street vendors also found (20%) which were similar to study performed in the Philippines indicated that street vendors play an important role in transmission of typhoid fever,⁸. Consumption of raw vegetables/fish growing in or contaminated sewerage (20%), were observed the result were similar to the study in Bangladesh^{9,10,11}.

Hand washing before meal with soap were only (34%) in this study. Same result were found in another study by Sur et al, Vollaard et al,^{11,12}. Most of the study patient used drinking water unboiled or contaminated water supply from WASA (70%),

(24%) patients were used tube-well water, (4%) patients used Ice and drinks from street vendors it were similar to study done by^{10,11,12}.

Conclusions

It was observed that poor sanitation and hygiene together with the absence of safe drinking water had high prevalence of this food and water born disease. There were highest percentages of enteric fever case among the female sex, younger age group with low educational level (Primary level), and lower-socioeconomic class, who had received contaminated food and drinks. This study may result in generate of awareness among the physicians to consider the diagnosis and take preventive measure. The observation of this study can provide guidelines to the future researchers.

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Original Article**Serum vitamin B 12 level in vitiligo patients: A case control study****Sumi MN¹, Akter QS², Rahman H³**

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Abstract

Background : Vitiligo is a common dermatological problem and the prevalence is more than 8% worldwide. It causes cosmetic disfigurement and psychological problem, which has an impact on person's social & professional life. It also causes sun burn and skin cancer. Low level of vitamin B 12 may play a role in the pathogenesis of vitiligo.

Objective: The present study was carried out to assess serum vitamin B 12 level in subjects with vitiligo.

Methods: This case control study was conducted in the Department of Physiology, Dhaka Medical College, Dhaka from July 2014 to June 2015. For this, 50 subjects with vitiligo aged 20-50 years were considered as the study group (Group B) and 50 age matched healthy subjects were considered as control group (Group A) for comparison. The subjects were selected from outpatient department of Dermatology & Venereology, BSMMU, Dhaka & from personal contact from different areas of Dhaka city on the basis of inclusion and exclusion criteria's. Serum vitamin B 12 level was measured.

For statistical analysis unpaired Student's 't' test and Pearson's correlation coefficient (r) test were performed as applicable using SPSS for windows version 22.0.

Results: In this study, serum vitamin B 12 ($p = 0.001$) was significantly lower in vitiligo patients as compared to healthy controls.

Conclusion: From the study results, it is concluded that nutritional deficiency of vitamin B 12 may be a precipitating factor in the pathogenesis of vitiligo & indirectly support the free radical mediated damage of melanocytes. Therefore, estimation of serum vitamin B 12 level in vitiligo patients & in addition vitamin B 12 supplementation might be beneficial for the treatment of vitiligo.

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Introduction

Vitiligo is an acquired, idiopathic disorder characterized by depigmented patches in skin due to destruction of melanocytes. People of all ages and both sexes are affected equally. Patients lose their skin color usually in a patchy and progressive manner¹. Clinically the activity of vitiligo is of two types, progressive and stable. In progressive disease there is enlargement of already present lesion and or the appearance of new lesion within two months and in stable vitiligo there is no change in the lesion within two months². The prevalence of vitiligo is around 1% in the United States & Europe. It ranges from < 0.1% to > 8% worldwide³. In India, the prevalence ranges from 0.09% to 8%. In China, Nepal & Sri Lanka the prevalence of vitiligo are 0.09%, 0.9% & 1.2 % respectively⁴.

Although vitiligo can affect any part of the body but the common sites are the exposed areas (face, neck,

eyelids, nostrils, finger tips & toes), body folds (armpits, groin), nipple, lips and genitalia. It starts as multiple pigmented mole that develops a peripheral pigmented zone then gradually become fade & disappear in time. The white patches gradually enlarge over weeks to months. Vitiligo extends rapidly for a few months then stabilizes⁵.

People with vitiligo may be at increased risk of developing social & psychological stress. The main impact of vitiligo is the psychological effect. Vitiligo patients have lower self-esteem, higher levels of perceived stigma and disability, anger, poorer Quality Of Life (QOL) overall and negative impact on sexual relationships⁶. Besides this patients may develop skin cancer & sun burn⁷.

The exact cause of vitiligo is unknown but the most probable mechanisms are free radicals induced & immune mediated damage of melanocytes⁸.

Free radicals like superoxide anion (O_2^-), hydroxyl radical (OH^-) cause lipid peroxidation & produce lipid peroxides & lipoxides. These oxides yield malondialdehyde that causes destruction of melanocytes⁹. Vitamin B 12 deficiency are the major determinants of serum homocysteine level because it is involved in homocysteine and methionine metabolism. Serum homocysteine level may increase with vitamin B 12 deficiency. Excess homocysteine induce oxidative stress which causes destruction of melanocytes¹⁰. Homocysteine has also an inhibitory action on the tyrosinase activity of skin. So, an increase in serum homocysteine level may interfere with normal melanogenesis & play a role in pathogenesis of Vitiligo¹¹.

Methods

The present study was a case control study and conducted in the Department of Physiology, Dhaka Medical College, Dhaka from July 2014 to June 2015. A total of 100 subjects were selected with age ranging from 20 to 50 years. Among them, 50 subjects with vitiligo were considered as the study group (Group B) and 50 age matched healthy subjects were considered as control group (Group A) for comparison. The subjects were selected from out patient department of Dermatology & Venereology, BSMMU, Dhaka & from personal contact from different areas of Dhaka city. Subjects with hypertension, diabetes mellitus, renal failure, hypothyroidism, pregnancy, vitamin B 12 supplementation were excluded from the study. After selection, the aim and benefit of the study was explained to each patient.

An informed written consent was taken from all the participants. Study protocol was approved by Institutional Ethical Review Committee of Dhaka Medical College. A detailed medical and family history of all subjects were recorded in a preformed questionnaire. Anthropometric measurement of the subjects was done and blood pressure was measured. With all aseptic precautions 5 ml blood from each study subject was collected after an overnight fast (at least 12 hours) to measure serum vitamin B 12 level. This parameter was estimated in the Department of Biochemistry, BSMMU, Dhaka by Chemiluminescent Microparticle Immunoassay Method. Data were analyzed by Student's 't' test and Pearson's correlation coefficient (r) test using SPSS for windows version 22.0.

Results

The general characteristics of study subjects and control group are presented in Table I. Both the groups were matched for age and BMI. Serum vitamin B 12 level was significantly lower in group B ($p < 0.005$) in comparison to those of group A (Table II a). Again, serum vitamin B 12 level was significantly lower in group B 2 in comparison to those of group B1 (Table II b).

Correlation of serum vitamin B 12 with duration of vitiligo is shown in Table III and Figure I. Serum vitamin B 12 level showed significant ($p < 0.05$) negative correlation ($r = - 0.424$) with duration of vitiligo (Figure 1).

Table I : General characteristics of the subjects in both groups (n=100)

| Parameters | Group | | p value |
|--------------------------|----------------------------------------|-----------------------------------------|---------------------|
| | Group-A Healthy subjects (n =50) | Group-B Vitiligo patients (n =50) | (A vs B) |
| Age | 35.00 ± 8.34 | 33.08 ± 6.53 | 0.203 ^{ns} |
| | (20 - 50) | (20 - 50) | |
| Sex | | | |
| Male | 25 (50.0) | 25 (50.0) | |
| Female | 25 (50.0) | 25 (50.0) | |
| Height (m) | 1.62 ± 0.07 | 1.62 ± 0.06 | |
| | (1.52 – 1.73) | (1.55 – 1.73) | |
| Weight (kg) | 61.66 ± 6.09 | 60.52 ± 6.36 | |
| | (50 - 70) | (52 - 70) | |
| BMI (kg/m ²) | 23.3 ± 1.5 | 22.8 ± 1.0 | 0.095 ^{ns} |
| | (20.7 – 27.4) | (21.0 – 25.8) | |
| Systolic BP (mmHg) | 117.80 ± 12.46 | 114.1 ± 7.6 | |
| | (100 - 180) | (100 - 125) | |
| Diastolic BP (mmHg) | 75.7 ± 7.0 | 75.8 ± 7.9 | |
| | (60 - 85) | (60 - 85) | |

Results are expressed as mean ± SD. Figure in parentheses indicate range. Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated & p value < 0.05 was accepted as level of significance. n = number of subjects

Table II (a): Study parameter of the subjects in both groups (n=100)

| Parameter | Group | | p value |
|---------------------------------------|----------------------------------------|-----------------------------------------|----------|
| | Group-A Healthy subjects (n =50) | Group-B Vitiligo patients (n =50) | (A vs B) |
| Serum vitamin B ₁₂ (pg/ml) | 335.5 ± 149.8 | 209.4 ± 60.7 | 0.001*** |

Results were expressed as mean ± SD. Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated & p value < 0.05 was accepted as level of significance. n = number of subjects, */**/** = significant

Table II (b): Study parameter in stable & progressive vitiligo patients in study group (n=50)

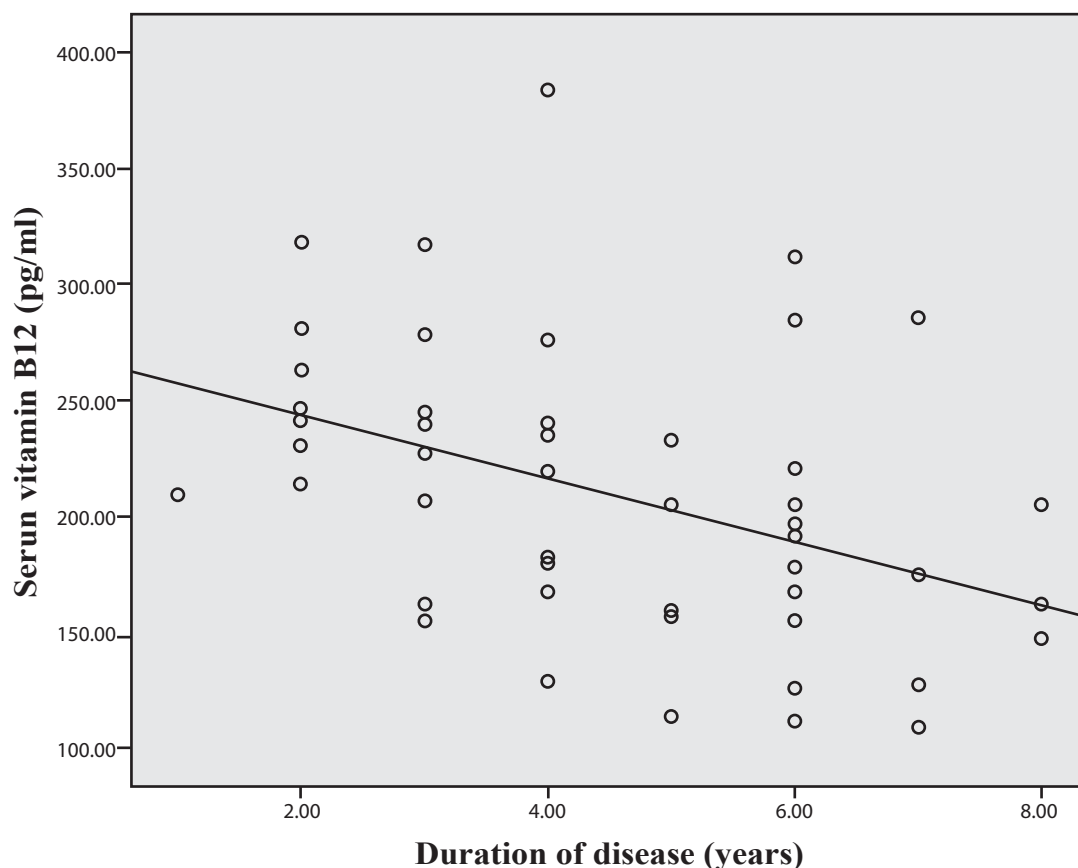
| Parameter | Activity of disease | | p value |
|---------------------------------------|-----------------------------------------------------|----------------------------------------------------------|----------------------------------|
| | Group-B ₁ Stable vitiligo (n = 26) | Group-B ₂ Progressive vitiligo (n = 24) | B ₁ vs B ₂ |
| Serum vitamin B ₁₂ (pg/ml) | 236.6 ± 56.2 | 180.0 ± 51.8 | 0.001*** |

Results were expressed as mean ± SD. Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated & p value < 0.05 was accepted as level of significance. n = number of subjects */**/** = significant

Table III: Correlation of study parameter with duration of disease in study group (n=50)

| Study parameter | Group B Vitiligo patients (n = 50) | |
|-------------------------------|---------------------------------------|---------|
| | r value | p value |
| Serum vitamin B ₁₂ | -0.424 | 0.002** |

Pearson correlation coefficient (r) test was performed to compare relationship between parameters. The test of significance was calculated and p value < 0.05 was accepted as level of significance. n = number of subjects, */**/** = significant

Figure 1: Correlation of serum vitamin B12 level with duration of disease in study subjects (n= 50)

● Group B: Study group (vitiligo patients)

— r = -0.424, p < 0.05**

n = Number of subject, ** = Significant

Discussion

The results of this study showed significantly lower serum vitamin B 12 level in vitiligo patients than control. Similar observations were reported by other investigators of different countries. In a Korean study the authors found that serum vitamin B 12 level was significantly lower than the healthy controls¹². On the other hand, no significant difference was observed for serum vitamin B 12 between vitiligo patients and healthy controls. In this study the authors found low vitamin B 12 level in vitiligo patients than healthy individuals but it was not statistically significant¹³.

This study also showed that the mean serum vitamin B 12 was significantly lower in progressive vitiligo patients than stable vitiligo patients. So estimation of serum vitamin B 12 in each progressive vitiligo patient should be done and monitored. In this study serum vitamin B 12 level showed significant negative correlation with duration of disease. So increased duration of vitiligo and decreased serum vitamin B 12 level was an important issue carried by this study. This observation was also reported by another study conducted in Indian vitiligo patients. The study also showed significant negative correlation between duration of Vitiligo and serum vitamin B 12 level¹⁴.

Conclusion

After analyzing the results of the study, it may be concluded that nutritional deficiency of vitamin B 12 may be an important factor to develop hyperhomocysteinemia. Increased level of serum homocysteine may be a precipitating factor in the pathogenesis of vitiligo by indirectly support the free radical mediated damage of melanocytes. Homocysteine lowering agents such as vitamin B 12 supplementation can be added in the vitiligo treatment protocol. Moreover, the therapeutic role of supplementation with vitamin B 12 in vitiligo patients needs to be studied further.

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Effectiveness of topical tacrolimus(0.01%)in Treatment of vitiligo

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Abstract

Background: Vitiligo is one of the most primitive well –known dermatoid disorders with different suggested therapies. Vitiligo is quite prevalent and constitutes a major physical & psychological health problem in Bangladesh. Cure and response rate of Vitiligo is significantly lower.

Methods: This was a record based observational prospective study. This study was conducted in a period of one year from Jan 2015 to Dec 2015 in a tertiary care hospital, in The out patient Department (OPD) of Dermatology and Venereology of Jahurul Islam Medical College & Hospital, Bajitpur, Kishoregonj. This study was performed in 44 number of patient with vitiligo in Dermatology Department in tertiary care hospital. Who received topical tacrolimus therefore this study investigated the efficacy of topical tacrolimus in treatment of vitiligo Patient.

Objective: To evaluate the effectiveness of topical tacrolimus in the treatment of vitiligo in tertiary care hospital in the Department of Dermatology.

Result: Newly diagnosed 44 vitiligo patient, aged more than one year up to 70 years of age were assigned for therapy and to observe the response. This study indicates that in case of vitiligo treatment topical tacrolimus was the most effective drug and does not seen any specified adverse effect during consumption of topical tacrolimus

Conclusion: From this study it maybe concluded that depigmentation rate of the vitiliginous spots is enhanced by the use of topical tacrolimus.

Key words: Topical tacrolimus, vitiligo.

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Introduction

Vitiligo is a depigmenting disorder of the skin of spontaneous onset. Occasionally, the loss of melanin (hypopigmentation) is partial. It is an acquired progressive disorder in which some or all of the melanocytes in the interfollicular epidermis and occasionally those in the hair follicles are selectively destroyed. It presents in childhood or adult life. It often involves the hands, feet, wrists, axilla, periorbital, perioral and anogenital skin. The association of vitiligo with other autoimmune disorders such as pernicious anemia, Addison's disease, diabetes mellitus and autoimmune thyroiditis¹. Patients with vitiligo present with one to several amelanotic macules that appear chalk or milk white in color. The macules are round and/or oval in shape often with scalloped margins. Vitiligo is classified as focal, segmental, acrofacial, generalized,

mucosal and universal vitiligo. Vitiligo occurs worldwide, with a prevalence of 2%¹. The disease usually begins in childhood or young adulthood with a peak onset at 10-30 years. Vitiligo can be psychologically devastating for the affected patient. This is especially true in patients with darker skin because of the great contrast between the color of vitiliginous skin and surrounding normal skin².

The highest incidence of the condition has been recorded in Indians from the Indian subcontinent, followed by Mexicans and Japanese¹. The etiology of vitiligo is unknown, but it seems to have genetic, autoimmune, neurological and extrinsic factors, involved in its pathophysiology. Treatment modalities that are currently used for vitiligo include topical corticosteroids, topical calcineurin inhibitors, ultraviolet light (PUVA or NB-UVB), pseudocatalase cream, surgery/transplantation, depigmentation therapy,

and immunomodulators like cyclosporine and levamisole. Recently, topical calcineurin inhibitors like Tacrolimus and Pimecrolimus have been introduced in the treatment of vitiligo. They are immunomodulators approved for the treatment of atopic dermatitis and alopecia areata by topical administration.³ Pimecrolimus 1% cream is a topical immunomodulating macrolactam that works as a calcineurin inhibitor and inhibits the maturation of various T cell inflammatory cytokines (IL-2, IL-3, IL-4, IL-5, IL-10, GM-CSF, IFN- γ and TNF- α) that are postulated to be involved in the destruction of melanocytes in some vitiliginous lesions³. The aim of this study is to analyze the effectiveness and safety of topical tacrolimus in the treatment of vitiligo. The evaluation of the repigmentation of lesion were done by i) Visual inspection by two physicians, ii) Wood's lamp examination to see the prognosis, iii) Photography iv) Patient opinion.

Materials and Methods

This was a record based, observational, prospective study. The study was conducted in a period of 1 year from January 2015 to December 2015 in Department of Dermatology OPD in tertiary care hospital (JIMCH). The patient with Vitiligo who were using topical tacrolimus, included in the study.

Inclusion criteria:

- i. Generalized, focal, segmental, acrofacial type of vitiligo
- ii. Patient with vitiligo more than 1 year age.

Exclusion criteria:

- i. Universal and mucosal type of vitiligo.
- ii. Patient with vitiligo less than 1 year.
- iii. Lactating mother and pregnant women
- iv. Vitiligo with psychiatric illness patient.
- v. Vitiligo with other dermatological diseases such as Scabies, Urticaria, Eczema, Bullous disorder, Tinea infection.

Non random sampling was employed for collecting data to analyze the pattern of using of topical tacrolimus in Vitiligo. Everyday new patients were enrolled until the sample size was attained.

Structured questionnaires were used to extract data from the patient's treatment sheet; information's were included; socio-demographic data, topical tacrolimus. Information collected in the routine clinical history including patient sex, age, type of vitiligo, site, size, number of lesion, age at onset, family history, precipitating factor associated disorder and activity of disease informed consent was obtain from all patients'/patients' guardian address and telephone number of the patients were taken to ensure follow up. Patients were evaluated by the same observers at 4 weekly intervals until 12 to 16 weeks and see percent-age pigmentation were recorded. During treatment patients were advised to apply sunscreen of SPF 28 or higher with frequent reapplication and incorporation of sun avoidance technique. Safety was assessed by monitoring and recording photography was done in a standard pose at base line. Depending on the extent of repigmentation, the response to treatment was categorized as marked to excellent (76-100%), good (51-75%), moderate (26%-50%), slight (1-25%) or absent repigmentation. Then the entire relevant data sheet entering into the computer for subsequent analysis using SPSS method version 20.1. The evaluation of the repigmentation of lesion were done by i. Visual inspection by two physicians. ii. Wood's lamp examination to see the prognosis. iii. Photography. iv. Patient opinion.

Result

Among 44 patients with vitiligo, focal 27 cases (61.39%) were showed that highest rate of type, genaralized and segmented vitiligo 7 cases 15.09% and 7 cases 15.09%. acroafcial 3(6.81%) cases which were less prevalence rate in JIMCH.

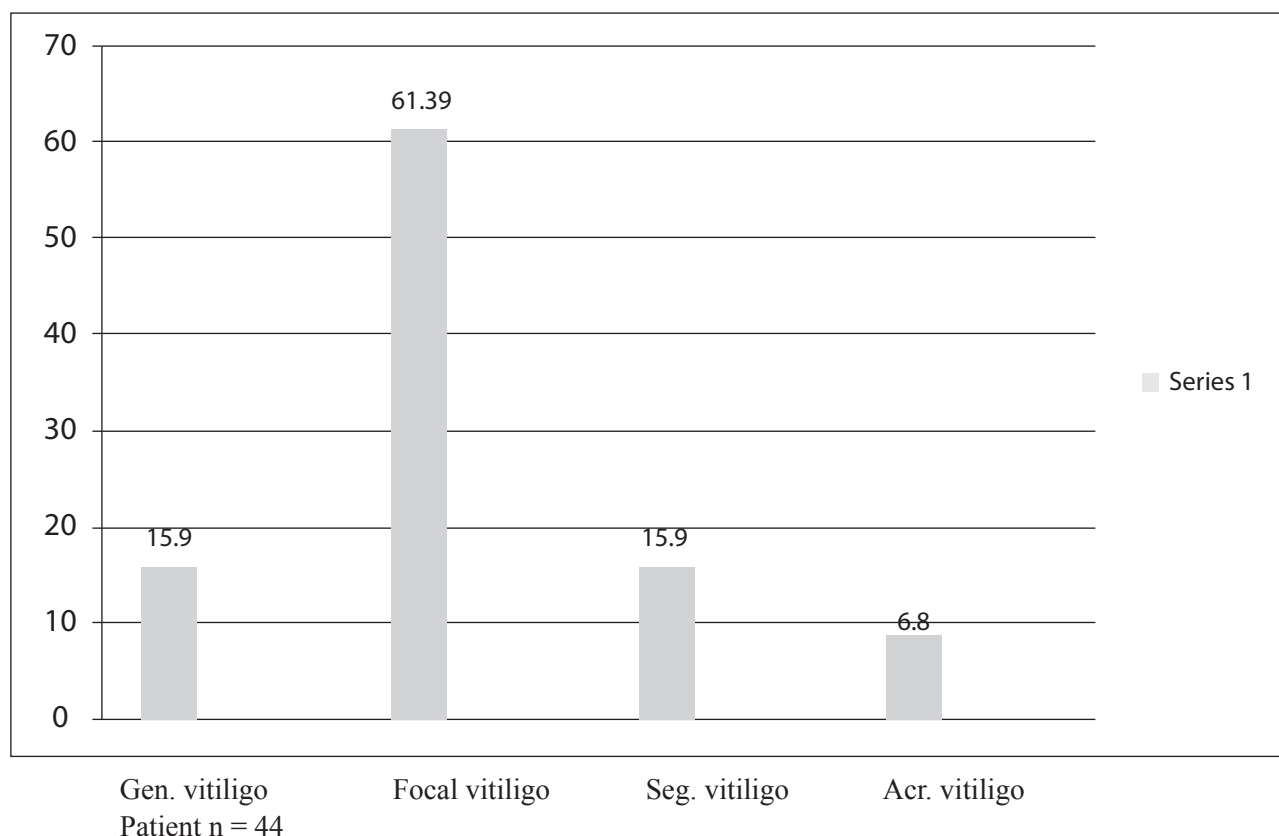


Figure 1: Type of vitiligo in Dermatology and Venereology Department in JIMCH

Table I: Type of Vitiligo According to sex

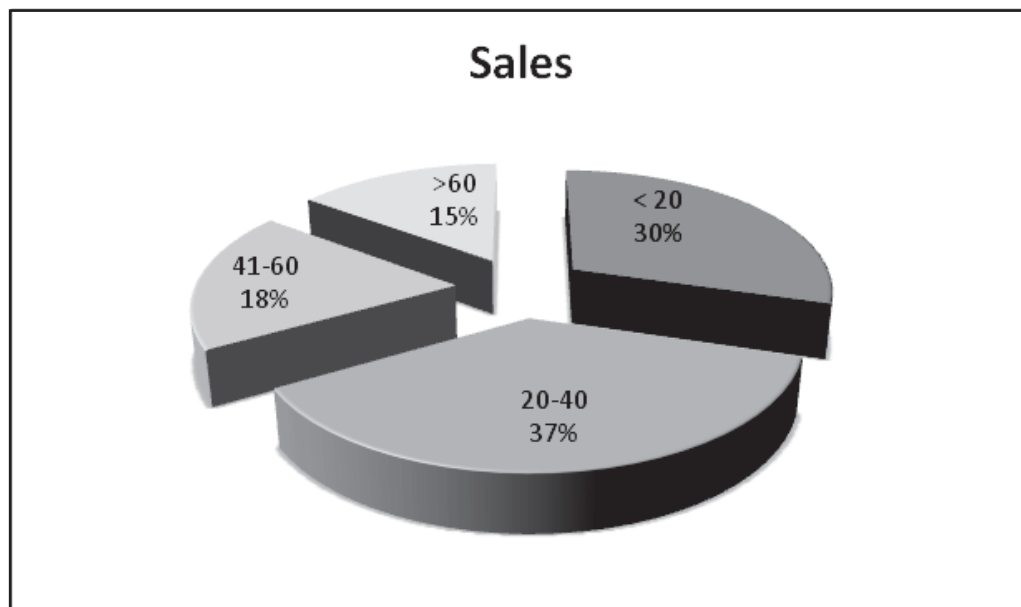
| Type of Vitiligo | Sex | |
|----------------------|-----------|------------|
| | Male% | Female% |
| Generalized Vitiligo | 5(33.33%) | 2(6.89%) |
| Focal Vitiligo | 8(53.33%) | 19(65.51%) |
| Segmental Vitiligo | 2(13.33%) | 5(17.24%) |
| Acrofacial Vitiligo | 0 | 3(10.34%) |

Table I: shows that among 44 cases male were 15 Cases and female were 29 case in gengeralized vitiligo male 5(33.55) and female 2(6.89%) in focal vitiligo male 8(53.33%) and female 19(65.51%) in segmental vitiligo 2(13.33%) and female 5(17.24%) were found. In acrofacial vitiligo male cases were not found and female 3(10.34%). Among 44 cases female are more predominant than male, where focal type was more , females (65.5%)

Table II: Response to treatment according to type of vitiligo

| Type of vitiligo | Response % | No-Response % | Total |
|----------------------|------------|---------------|-------|
| Generalized Vitiligo | 4(57.14%) | 3(42.85%) | 7 |
| Focal Vitiligo | 22(81.48%) | 5(18.51%) | 27 |
| Segmental Vitiligo | 5(17.42%) | 2(28.57%) | 7 |
| Acrofacial Vitiligo | 2(66.66%) | 1(33.33%) | 3 |

Table II: shows among 7 generalized vitiligo cases, response was found 4 cases (57.14%) and no-response 3(42.85%), in case of focal type of response was found 22 (81.48%) cases and no-esponse 5(18.51%), in cases segmental Vitiligo response was 5(17.42%) cases and in case acrofacial type response 2(66.66%) cases and no-response 1(33.33%) . This shows that highest response rate in focal type of vitiligo (81.48%), while in segmental vitiligo, and acrofacial vitiligo, the response rate were (17.42%), (66.66%) and (57.14%) respectively.

**Figure 2:** Pie diagram showing focal vitiligo according to age group

Photograph Showing Effect of Treatment of topical tacrolimus (Photograph A and Photograph B)



Photograph A: Depigmentation of face Photograph B: After 3 month of twice daily application of topical tacrolimus (0.1%) (After treatment)

Discussion

Vitiligo is an acquired pigmentation disorder, characterized by depigmented patch, as a result of the disappearance of functioning melanocyte from the epidermis. This condition, cosmetically disfiguring especially in dark-skinned individuals, makes the lesional skin more sensitive to sunburns and affects 0.1-2% of the world's population, irrespective of gender and race¹. In this present study among 44 patients with vitiligo, focal were highest rate (61.39%) of type, generalized and segmental (15.90%) and acrofacial (6.81%) which was lowest rate of type. A previous study in India done by Reghu and James showed that generalized vitiligo (53.7%) which was highest in rate and focal (18.8%), segmental (8.8%) and acrofacial (13.8%) which were little bit dissimilar with our study. In this present study among 44 cases with vitiligo, highest rate (30%) of focal vitiligo < 20 years of age. On the other hand lowest rate of vitiligo was acrofacial variety which was (15%) in age group > 60 years. A previous study done in Kerala, India where vitiligo is more common (45%) in around 20 years of age which was little bit dissimilar to our study¹. In this present study sex ratio revealed higher in case of female 29 cases most found focal type of vitiligo in 19 case (65.51%) with male female ratio of (1:2). According to different previous studies adult and children of both sexes are equally affected although the greater number of reports among female is probably due to the greater social consequence to women and girls affected by this condition. A previous study in Bangladesh done by Hazra et al⁴ reported that female 60% are more prone to develop vitiligo which is similar to our study though it is very difficult to judge the efficacy of treatment without studying the compliance rate and follow up for a long time. In this study response to topical tacrolimus in the treatment of vitiligo has been observed which shows in 80% patient in focal type which was excellent repigmentation rate. On the other hand, repigmentation rate of topical tacrolimus shows patient in type of vitiligo, (65%) pt in acrofacial and 57% in type of generalized vitiligo.

A previous study done in New York, America, topical tacrolimus to be more effective in the treatment of vitiligo which was similar to our study⁵. But other previous studies revealed that repigmentation was enhanced by the use of NB-UVB with topical tacrolimus. Another study in Nepal done by Shrestha and others where topical tacrolimus ointment could be better option for the treatment of vitiligo which was similar to this study⁶.

The efficacy of the 308 nm excimer laser for the treatment of localized vitiligo is confirmed, but should be proposed only for UV sensitive areas. The combination of 0.1% tacrolimus ointment applied twice daily and 308nm excimer laser therapy performed twice a week gives excellent result on UV sensitive and UV resistant areas⁷. It is not done in our country because this therapy is very expensive.

Conclusion

Vitiligo is quite prevalent and constitutes a major Psychological health problem in Bangladesh. In our study repigmentation rate was observed in 80% patients in topical tacrolimus. So, this study reflects that topical tacrolimus is a most effective topical therapeutic option for the treatment of vitiligo.

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Comparison of performance of Glasgow, BISAP & Ranson scores in Predicting Severity of Acute Pancreatitis

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Abstract

Background: Different modalities are available for predicting severity of acute pancreatitis. Several scoring systems like Glasgow, BISAP & Ranson scores have been developed to predict the severity.

Objective: This study aims at comparing the performance of these scores in predicting severity of acute pancreatitis.

Methods: A total of 117 patients admitted with acute pancreatitis were included. Clinical parameters and biochemical tests were recorded on admission, on day 3 & day 5 of admission. Glasgow, BISAP, Ranson scores were calculated using these data. Every patient was followed regularly for identification of any complication. Statistical analysis was done with SPSS.

Result: Among 117 patients, 67(57.3%) were male with a mean age of 47.99 ± 15 . The etiology was found to be biliary, hypertriglyceridemia, alcohol, malignancy and post-ERCP complications in 25(21.4%), 23(19.7%), 8(6.8%), 3(2.6%), 2(1.7%) cases respectively. 83(70.9%) patients had mild, 15(12.8%) had moderately severe and 19(16.2%) had severe acute pancreatitis. ROC curve showed an AUC of 0.991 for Glasgow score in predicting severity. A cut-off of 3 showed highest sensitivity(100%), specificity(76.5%), positive-predictive-value(45.2%), negative-predictive-value(100%). BISAP score showed an AUC of 0.998 in predicting severity. A cut-off of 2 showed highest sensitivity (100%), specificity (90.8%), positive-predictive-value(67.9%), negative-predictive-value (100%). Ranson score had an AUC of 0.943. A cut-off of 3 showed highest sensitivity(78.9%), specificity(92.9%), positive-predictive-value (68.2%), negative-predictive-value(95.8%).

Conclusion: Glasgow & BISAP scores showed better performance than Ranson score on ROC. Glasgow & BISAP scores showed highest sensitivity (100%) for predicting severity. BISAP score was the best among all the scoring systems, followed by Glasgow score which also performed well. Ranson score did not perform up to the mark.

Key words: Glasgow score, BISAP score, Ranson score, Predictor, Severity, Acute pancreatitis.

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Introduction

Acute pancreatitis accounts for 3% of all cases of abdominal pain admitted to hospital¹. The incidence of acute pancreatitis appears to be increasing². As the population is becoming increasingly overweight, the incidence of gallstones, the most common cause of acute pancreatitis, is rising. Whereas gallstones and alcohol appear to be the cause of acute pancreatitis in the majority of cases, many other conditions like hypertriglyceridemia predispose to acute pancreatitis to varying degrees³.

About 80% of all cases are mild and have a favorable outcome. Of the rest 20% of patients with severe disease, almost all (98%) die within the first week,

usually from multiorgan failure. After this time the majority of deaths result from sepsis, especially that complicating infected necrosis. On admission it is possible to predict patients at risk of this complication¹. Predicting severity of pancreatitis early in the course of disease is critical to maximize therapy and to prevent and minimize organ dysfunction and complications. Unfortunately, the management of patients with acute pancreatitis is complicated by the inability to distinguish mild from severe disease during the early stages³. Severe acute pancreatitis has a poor prognosis and early prediction of the severity helps us in taking

appropriate steps to halt the disease progression and to reduce development of complications. Several predictors (biochemical parameters, clinico-biochemical scores and radiological scores) have been used to predict the severity of acute pancreatitis. Glasgow score proposed by Imrie uses 8 laboratory factors within the first 48 hours of admission to calculate it⁴, and more than three positive criteria indicate severe acute pancreatitis. Ranson's score is composed of 11 measures that are recorded on admission and at 48 hours. A composite score of 3 or more is commonly used to classify a patient as having severe disease⁵. BISAP score is a prognostic scoring system containing data that are frequently evaluated at the time of admission⁶. BISAP score has the advantage over Ranson and Glasgow scores of being calculated within 24 hours of admission. Several studies have been conducted to compare their performance in the early prediction of severity of acute pancreatitis. But no such study is done in our country till now. This study aims at comparing the role of Glasgow, BISAP & Ranson scores in the prediction of severity of acute pancreatitis.

Material and Methods

This prospective and observational study was done in the department of Gastrointestinal, Hepatobiliary and Pancreatic Disorders (GHPD), Square Hospitals Ltd, Dhaka, Bangladesh from January, 2018 to June, 2019. Patients aged more than 18 years, admitted with abdominal pain and fulfilling the diagnostic criteria of acute pancreatitis by clinical history, physical examination, biochemical tests and different imaging modalities were included in this study. Patients attending after 72 hours after the onset of abdominal pain, patients having chronic pancreatitis, chronic kidney disease, serious co-morbid conditions like COPD, heart failure and patients suffering from severe infection or inflammation of any other organ system were excluded from the study. Patients unwilling to give voluntary consent to participate in the study were also excluded. Consecutive type of non-probability sampling technique was applied to enroll the patients. Prior to the commencement of this study, the research protocol was approved by the Ethical Review Committee (ERC). The aims and objective of the study along with its procedure, alternative diagnostic methods, risk and benefits were explained to the patients in easily understandable local language and then informed consent was taken from each patient.

A predesigned structured questionnaire was used for recording all the data. To detect etiology of acute

pancreatitis, liver function test, fasting lipid profile, USG of abdomen were done in all cases. Demographic data like age, sex, BMI; clinical data like presence of abdominal pain, severity and radiation of abdominal pain, abdominal lump, anemia, fever, GCS score, vital parameters were recorded. Laboratory data like CBC with HCT, CRP, BUN, serum creatinine, FBS, HbA1c, serum amylase, serum lipase, serum bilirubin, serum albumin, AST, ALT, alkaline phosphatase, serum LDH, fasting lipid profile, ABG, CA 19.9, USG and CT scan of upper abdomen findings were recorded. Laboratory tests were done on admission and CBC with HCT, CRP, BUN, serum creatinine, ABG were repeated on day 3 and on day 5 of admission to follow up the patient. Glasgow, BISAP & Ranson scores were calculated using these data. Computed tomography (CT) scan was performed in all patients after 72 hours of admission for detection of the development of fluid collections, the extent of inflammation, and necrotic changes. Attacks of acute pancreatitis were classified as mild, moderately severe and severe according to revised Atlanta criteria and with the help of modified Marshall scoring system for organ failure. Every patient was followed regularly for identification of organ failure or any other complication. Data were analyzed by computer analysis method using SPSS version 22.

Statistics

Statistical analyses were carried out by using the Statistical Package for Social Sciences version 22.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean, standard deviation, and categorical variables as frequencies and percentages. ROC curves were plotted for evaluating the performance of Glasgow, BISAP & Ranson scores as predictors of severity of acute pancreatitis. On the basis of the highest sensitivity and specificity values generated from the receiver operating characteristic (ROC) curves, the following cut-offs were selected for further analysis. Glasgow ≥ 3 , BISAP ≥ 2 & Ranson ≥ 3 . These cutoffs were further evaluated by chi-square (X^2) test. A p-value of <0.05 was considered as significant.

Results

A prospective observational study was carried out to evaluate the role of Glasgow, BISAP & Ranson scores in predicting severity of acute pancreatitis. Total 117 patients with acute pancreatitis, who fulfilled the inclusion criteria, were included in this study. The result of the study is presented in following tables and diagrams.

Table 1: Demographic, clinical and biochemical characteristics of the study population (n=117)

| Parameters | Result |
|---------------------------|-------------|
| Age (years) | 47.99±15.90 |
| Sex (Male) | 67(57.3) |
| Contributing factor | |
| Smoking | 36(30.8) |
| Alcohol | 10(8.5) |
| Tea/ coffee | 93(79.5) |
| OCP | 3(2.6) |
| DM | 82(70.1) |
| BMI | 25.36±3.4 |
| Clinical features | |
| Abdominal pain | 117(100.0) |
| Nausea and / or vomiting | 109(93.2) |
| Fever | 24(20.5) |
| Duration of hospital stay | 8.04±4.26 |
| HCT | 37.23±4.80 |
| Blood urea nitrogen | 17.40±9.61 |
| CRP | 60.61± 81.2 |

Values are expressed as mean±SD. Values within the bracket are expressed as percentage.

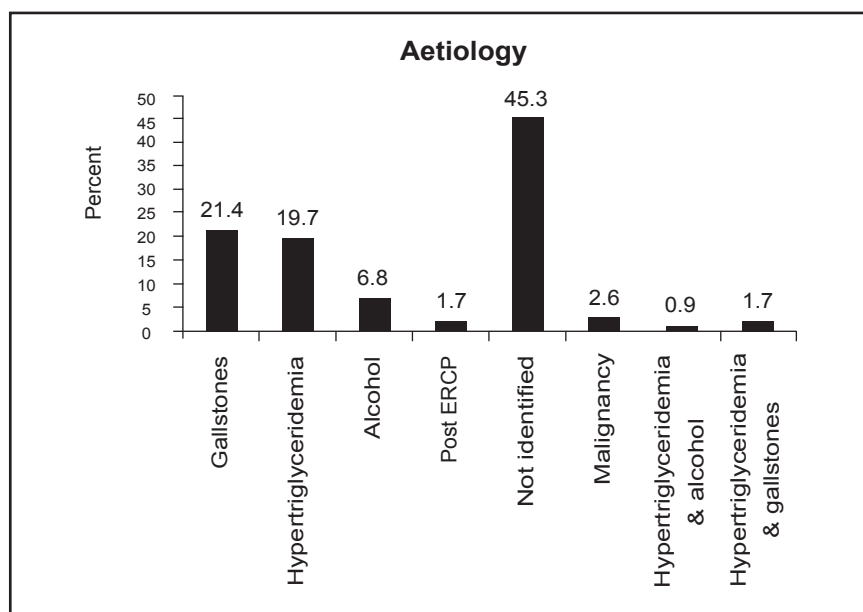
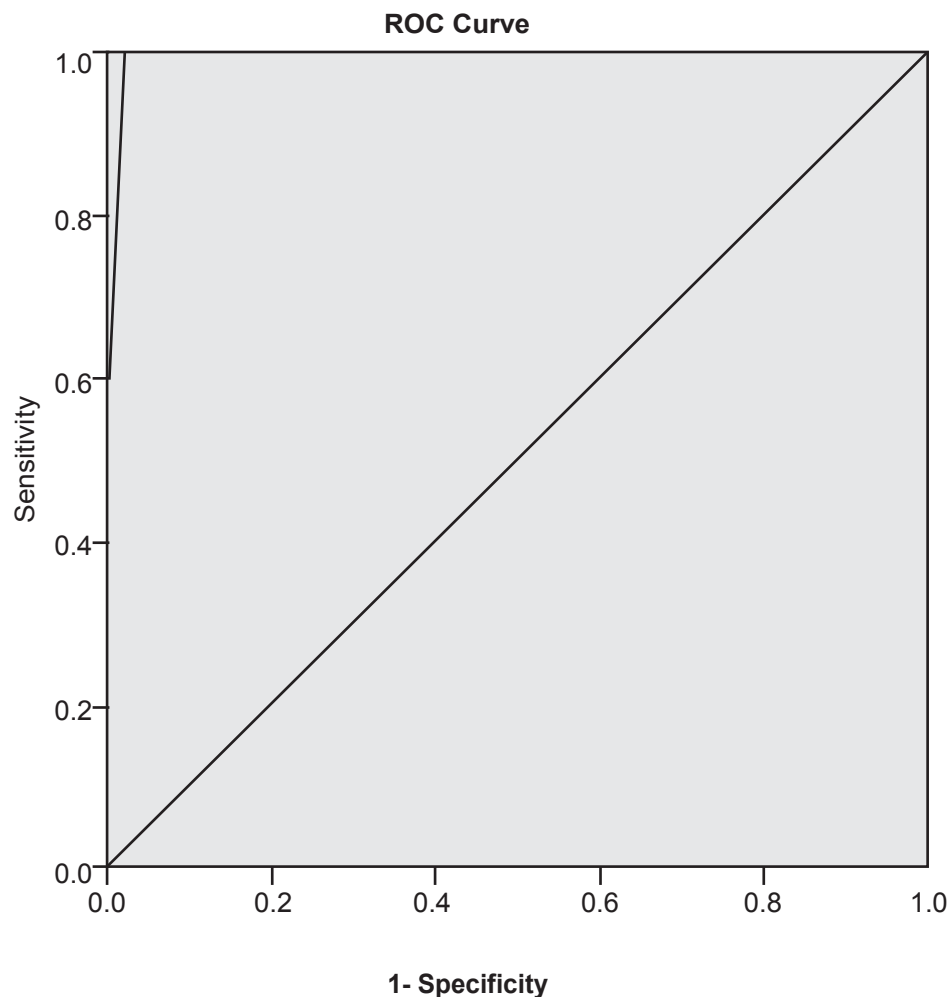
**Figure 1:** Distribution of patients according to etiology in percentage (n=117).

Table 2: Performance test of Glasgow score as a predictor of severity of acute pancreatitis (n=117)

| Glasgow score | Severity | | Total | p-value |
|---------------|---------------------------|-------------------------------------------|-------------|---------|
| | Severe acute pancreatitis | Mild & moderate severe acute pancreatitis | | |
| ≥ 3 | 19 (100) | 23 (23.5) | 42 (35.9) | <0.001 |
| < 3 | 0 (0) | 75 (76.5) | 75 (64.1) | |
| Total | 19 (100.0) | 98 (100.0) | 117 (100.0) | |

Chi-square(X²) test was done to measure the level of significance



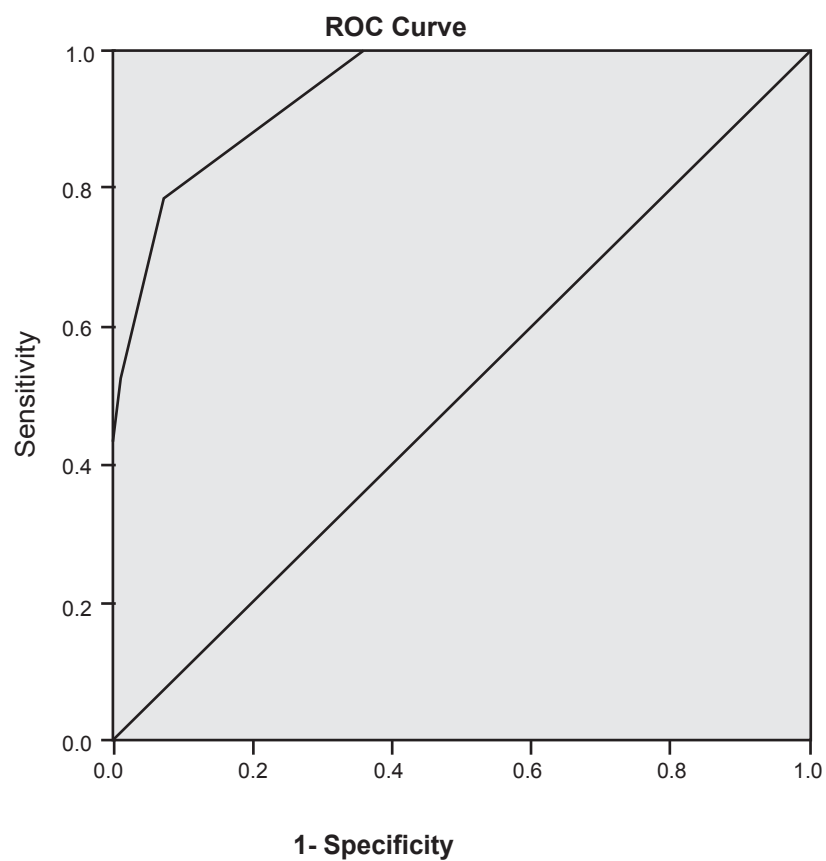
Diagonal segments are produced by ties.

Figure 4: ROC curve showing test accuracy of BISAP score in the prediction of severity of acute pancreatitis (AUC=0.998, $p<0.001$).

Table 3: Performance test of BISAP score as a predictor of severity of acute pancreatitis (n=117)

| BISAP score | Severity | | Total | p-value |
|--------------|---------------------------|-------------------------------------------|-------------|---------|
| | Severe acute pancreatitis | Mild & moderate severe acute pancreatitis | | |
| ≥ 2 | 19 (100) | 9 (9.2) | 28 (23.9) | <0.001 |
| < 2 | 0 (0) | 89 (90.8) | 89 (76.1) | |
| Total | 19 (100.0) | 98 (100.0) | 117 (100.0) | |

Chi-square(X²) test was done to measure the level of significance



Diagonal segments are produced by ties

Figure 5: ROC curve showing test accuracy of Ranson score in the prediction of severity of acute pancreatitis (AUC=0.943, p<0.001).

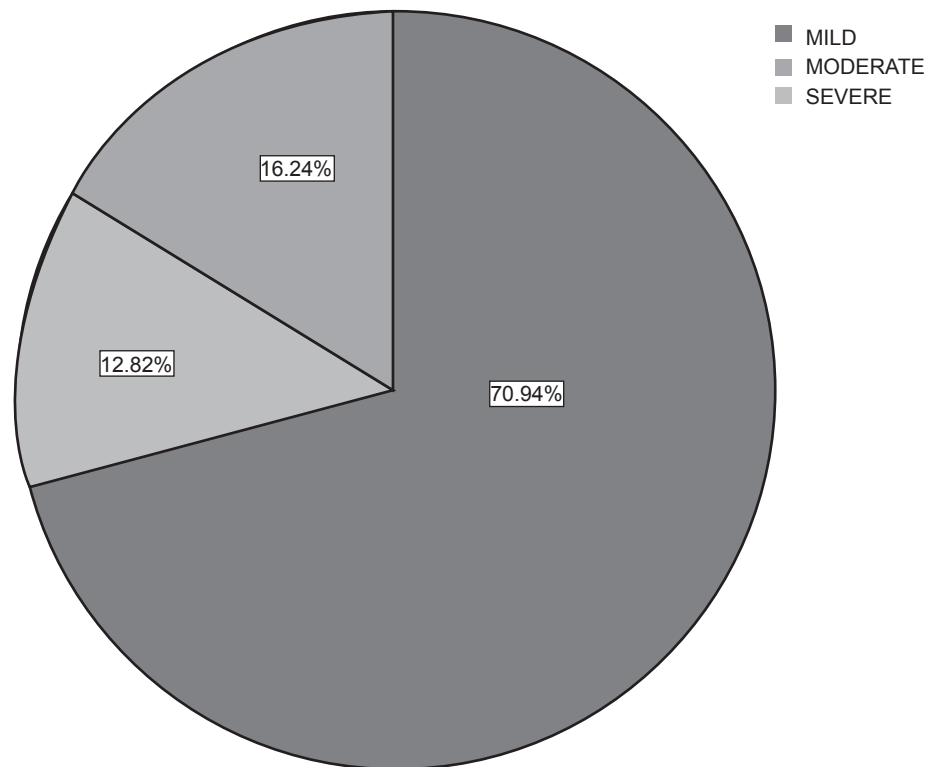


Figure 2: Distribution of patients according to severity of acute pancreatitis based on revised Atlanta criteria (n=117).

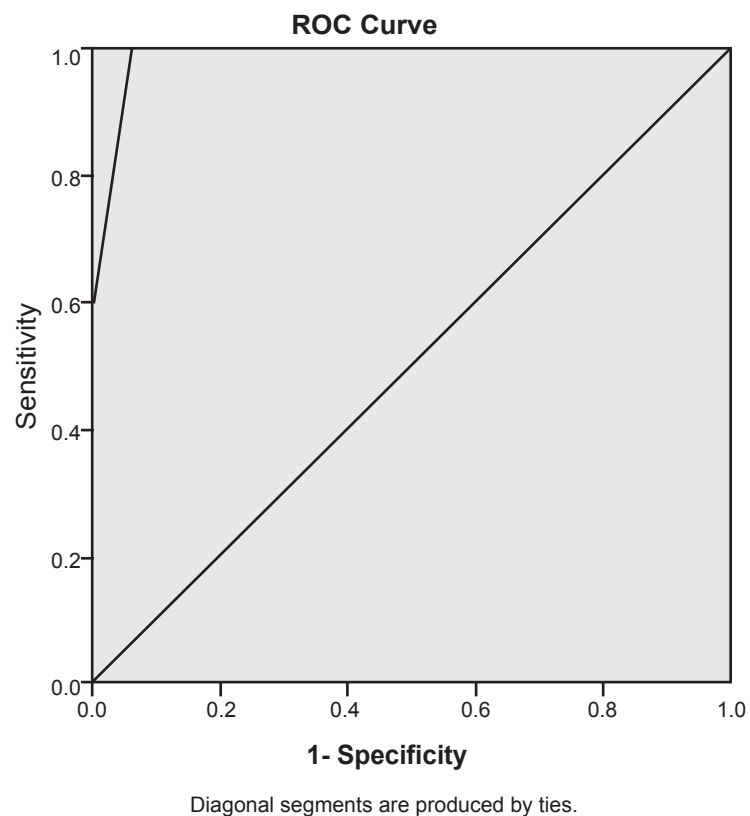


Figure 3: ROC curve showing test accuracy of Glasgow score in the prediction of severity of acute pancreatitis (AUC=0.991, $p<0.001$).

Table 4: Performance test of Ranson score as a predictor of severity of acute pancreatitis (n=117)

| Ranson score | Severity | | Total | p-value |
|--------------|---------------------------|-------------------------------------------|-------------|---------|
| | Severe acute pancreatitis | Mild & moderate severe acute pancreatitis | | |
| ≥ 3 | 15 (78.9) | 7 (7.1) | 22 (18.8) | <0.001 |
| < 3 | 4 (21.1) | 91 (92.9) | 95 (81.2) | |
| Total | 19 (100.0) | 98 (100.0) | 117 (100.0) | |

Chi-square (X²) test was done to measure the level of significance

Discussion

A prospective observational study was carried out to evaluate the role of serum procalcitonin in predicting severity and outcome of acute pancreatitis. Total 117 patients with acute pancreatitis, who fulfilled the inclusion criteria, were included in this study.

Among the patients, 67(57.3%) patients were male and 50(42.73%) patients were female (table I). Mean age of the study population was 47.99±15.90 (mean± SD) with minimum age 18 years and maximum age 95 years. In a study by Albulushi et al.⁷ found the mean age of acute pancreatitis of 47 years among which 55 % were male and 45% were female. The mean age and sex difference of the above study correlate with this study.

In this study 82(70.1%) patients were diabetic and this can be explained by inclusion of patients from a tertiary level diabetic hospital. Haque MM⁸, in his study also found that 66.2% of the patients were diabetic. Out of 117 patients, 36(30.8%) were smoker and 10 (8.5%) were alcoholic. 55(47%) patients were over weight and 12 (10.3%) patients were obese. Mean BMI was 25.36±3.4. Haque MM⁸ found that mean BMI was 25.88±2.95.

The mean CRP (mg/L), Hematocrit (HCT) (%) & Blood Urea Nitrogen (BUN) (mg/dl) were 60.61±81.2, 37.23±4.8 & 17.40±9.61 respectively. Average duration of hospital stay was 8.04±4.26 days. HaqueMM⁸, in his study also found that mean HCT was 32.9±7.5, mean BUN was 21.7±7.2 and average duration of hospital stay was 7.8±2.5 days. All of which is almost similar to these study results.

In this study, 25(21.4%) cases were gall stone pancreatitis, 23(19.7%) cases were due to hyper triglyceridaemia, 8(6.8%) cases were due to alcohol, 3(2.6%) cases were due to malignancy, 2 (1.7%) cases due to post ERCP complications, 2(1.7%) cases were due to gall

stones and hypertriglyceridemia and 1 (0.9%) cases were due to hyper triglyceridaemia and alcohol (figure 1). In 53(45.3%) cases no definite etiology could be found. Al-Karawi et al.⁹ found that 67.5% cases of acute pancreatitis were due to biliary cause; alcohol was responsible in 1.8% of cases and 17% cases were due to unknown cause. In another study, Chang et al.¹⁰ found gall stone as etiology in 34.1% of cases and alcohol in 33.6% cases and hyper triglyceridaemia in 12.3% of cases.

High prevalence of hypertriglyceridemia in this study could be explained by increased prevalence of DM, obesity and metabolic syndrome among the study population. And the low prevalence of alcohol as etiology of acute pancreatitis could be due to social custom as well as religious belief.

Out of 117 patients 83(70.9%) had mild acute pancreatitis according to revised Atlanta criteria, 15(12.8%) patients had moderately severe acute pancreatitis and 19(16.2%) patients had severe acute pancreatitis (figure 2). Cho et al.¹¹ found 13% cases as severe acute pancreatitis, 8% cases as moderately severe and 79% cases as mild acute pancreatitis in their study which is similar to present study.

Glasgow score proposed by Imrie uses 8 laboratory factors within the first 48 hours of admission to calculate it 4, and more than three positive criteria indicate severe acute pancreatitis.

Ranson and colleagues identified 11 signs that had prognostic significance during the first 48 hours. Higher Ranson's scores predict more severe disease. In mild pancreatitis (scores <2), the mortality is 2.5% and in severe pancreatitis (scores >3) the mortality is 62%.¹² Also, the higher the Ranson's score, the higher the incidence of systemic complications, necrosis, and infected necrosis. These criteria are still widely used in both the United States and Europe.¹³ The overall sensitivity of the Ranson criteria (using 3 signs as the

cutoff for diagnosing severe disease) is only 40% to 88%, and the specificity is only 43% to 90%. The positive predictive value is approximately 50%, and the negative predictive value around 90%.¹⁴ Therefore, the better use of Ranson score is to exclude severe disease. Ranson score is typically not achieved until 48 hours. By this time, it is usually apparent that the patient has developed severe disease as manifested by organ failure.

In order to develop a simpler scoring system for patients with acute pancreatitis that would be useful within the first 12 hours from admission, the Pancreas Center at Brigham and Women's Hospital performed a series of studies retrospectively and prospectively.¹⁵⁻¹⁷ The studies were performed on a large database including almost 37,000 patients from more than 200 hospitals. After careful analysis, including a validation study, they determined that a simple system that included 5 variables could accurately determine severity early in the course of the disease. The scoring system, referred to as BISAP (Bedside Index for Severity in Acute Pancreatitis), also assigns the first letter of each parameter 1 point. Thus, the BISAP score provides 1 point for 5 parameters: BUN greater than 25 mg/dL, impaired mental status, SIRS, age older than 60 years, and pleural effusion, for a possible total of 5 points. A BISAP score of 4 or 5 is associated with a 7- to 12-fold increased risk of developing organ failure. Accurate, yet much easier to use, this new simple scoring system appears to be useful in the early identification of patients who are at risk of developing complications and mortality.

In this study the aim was to compare the performances of these scoring systems in predicting severity of acute pancreatitis. ROC curves were plotted for evaluating the performance of Glasgow, BISAP & Ranson scores. ROC curve evaluating the role of Glasgow score predicting severity of acute pancreatitis showed an AUC of 0.991. A cut off point of 3 showed highest sensitivity (100%), specificity (76.5%), positive predictive value (PPV) (45.2%) and negative predictive value (NPV) (100%). Khanna et al¹⁸ in his study found an AUC of 0.75 for Glasgow score in predicting severity of acute pancreatitis and a cutoff of 3 had a sensitivity of 71%,

specificity of 78% with a positive predictive value (PPV) of 71% and a negative predictive value (NPV) of 78%. Although the specificity is similar with our study, the sensitivity is much higher in our study. AUC was much higher in our study as well. ROC curve evaluating the role of BISAP score in predicting severity of acute pancreatitis showed an AUC of 0.998. A cut off point of 2 showed highest sensitivity (100%), specificity (90.8%), positive predictive value (PPV) (67.9%) and negative predictive value (NPV) (100%). Whereas Khanna et al.¹⁸ found an AUC of 0.80 for BISAP score in predicting severity of acute pancreatitis and a cutoff of 2 had a sensitivity of 74.2%, specificity of 68.3% with a positive predictive value (PPV) of 63.4% and a negative predictive value (NPV) of 77.8% in their study. ROC curve evaluating the role of Ranson in predicting severity of acute pancreatitis showed an AUC of 0.943. A cut off point of 3 showed highest sensitivity (78.9%), specificity (92.9%), positive predictive value (PPV) (68.2%) and negative predictive value (NPV) (95.8%). Khanna et al¹⁸ in his study found an AUC of 0.85 for Ranson score in predicting severity of acute pancreatitis and a cutoff of 3 had a sensitivity of 83.9%, specificity of 78% with a positive predictive value (PPV) of 74.3% and a negative predictive value (NPV) of 86.5%.

Conclusion

This study was done to compare the performance of Glasgow, BISAP & Ranson scores in predicting severity of acute pancreatitis. ROC curve showed effectiveness of Glasgow, BISAP & Ranson scores in predicting severity of acute pancreatitis. Glasgow & BISAP scores showed better performance than Ranson score on ROC. Glasgow & BISAP scores showed highest sensitivity (100%), on the other hand Ranson score showed highest specificity (92.9%) for predicting severity of acute pancreatitis. BISAP score was the best among all the scoring systems, followed by Glasgow score which also performed well. Ranson score did not perform up to the mark.

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Case Report

Woolly hair-A rare entity

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Abstract

Woolly hair is the presence of more or less tightly coiled hair over the scalp of persons of non-African or Negroid background. A 21 year-old boy presented with woolly hair since birth. We are presenting this case due to its sheer rarity.

Key words: Hair shaft, Woolly hair

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Introduction

Woolly hair is a rare congenital abnormality of the structure of the scalp hair characterized by tightly coiled hair involving part of the entire scalp occurring in an individual of non-negroid origin¹.

It was first observed and described by Gossage in 1907 in a European family². In 1974, Hutchinson et al, classified woolly hair into three variants. A localized variant (woolly hair nevus) and two generalized variants, including autosomal dominant hereditary woolly hair and autosomal recessive (AR) familial woolly hair³. In addition to these, diffuse partial woolly hair (manifesting during adolescence and adulthood) has also been described as a separate entity⁴. In many cases, woolly hair is associated with hypertrichosis.

Woolly hair usually implies a benign condition best described as normal hair with a tight curl, which is sometimes frizzy resembling Negroid hair. As one ages the extent of curl may reduce. Prevalence is unknown. Woolly hair can either be present at birth or appear in the first month of life².

Woolly hair syndrome is distinguishable from normal curly hair in that the hair shaft demonstrates characteristic exaggerated tight often frizzy coils. The affected hair shafts frequently possess a narrower oval cross section with prominent axial twisting. The hair may be difficult to comb due to the narrow diameter curls (generally not exceeding 0.06cm). Trichorrhexis nodosa may be present resulting in increased severance⁵.

Case Report

A 21 years old 3rd year MBBS medical student of MH Somorita Medical College, Dhaka presented with sparse hairs since birth. His parents felt the hairs be unruly and hence attempted repeated tonsuring. In spite of this, the hair remained the same. His development milestones were normal to his age. There was no history suggestive of physical or mental retardation and no history suggestive of systemic involvement. Skin and nails were normal and there was no dental abnormality and palmoplantar keratoderma. Systemic examination was within normal limits.

Routine hematological investigations including complete blood count, liver and renal function tests, chest radiograph and urine analysis were within normal limits. Light microscopic examination of the hair was normal. Potassium Hydroxide (KOH) examination of the hair revealed no fungal growth. There were no cardiac manifestations (detailed cardiac evaluation including electrocardiogram and echocardiography was normal) or any systemic involvement. There were no similar complains in the family members. Based on the history, clinical presentation and investigations, we arrived at a diagnosis of woolly hair.

Discussion

Woolly hair syndrome is a group of disorders involving structural defects in the hair shaft characterized by extreme kinkiness of scalp hair commonly seen in Caucasians and Asians⁵. Familial woolly hair is probably transmitted as autosomal recessive inheritance and there is a marked reduction in the diameter of hair shafts, which may be poorly pigmented. It is present at birth with tightly coiled, thin caliber hair, which usually grows only 2-3 cm due to a truncated anagen phase³. The hair normally lighter in color than that of unaffected family members and capillary diameter is smaller than that of normal hair. In transverse section, the follicle of hair appears oval and not round. The growth rate of hair is normal. The anagen: telogen ratio also normal, but the anagen phase of the hair growth is shorter and hair root in this phase is usually dystrophic and has no sheath. Hair becomes fragile when woolly hair is associated with Trichorrhexis nodosa common in the dominant hereditary variant and extremely rare in the recessive familial variant⁶.

Isolated forms are mostly due to homozygous or sometimes heterozygous mutations in the genes lipase H (LIPH) and Lysophosphatidic acid receptors 6 (LPAR6) that act along a common pathway which plays an important role in the control of hair growth as well of hair texture. In only very few patients heterozygous mutations have been reported in two keratin genes, namely KRT74 and KRT71. The syndromic forms are due to mutations in (carvajal syndrome)⁷, desmoplakin (DSP)⁸, plakoglobin (JUP) and ATPase copper transporting polypeptide (ATP7A) (Menkes disease). Just recently mutations have been reported in KANK2 which encodes the steroid receptor co-activation (SRC) interacting proteins (SIP), for a family with woolly hair and keratoderma without any accompanied heart defects. The etiology of the diffuse partial woolly hair and sporadically occurring woolly



Figure: Woolly hair

hair nevi is unknown. Woolly hair can also be syndromic, occurring in combination with dilated cardiomyopathy and palmoplantar keratoderma (Carvajal syndrome) with arrhythmogenic right ventricular cardiomyopathy and palmoplantar keratoderma (Naxos syndrome) or with growth failure and neurological symptoms (Menkes disease). In addition, a family with woolly hair has been reported with features of ectodermal dysplasia in the form of nail dystrophies, aural hyperkeratosis and changes in peridontium⁹.

Generalized forms due to KRT74 and KRT71 mutations are autosomal dominant and forms due to LIPH and LPAR6 mutations are autosomal recessive. Syndromic forms are all recessive. Sporadic diseases occur. Follicular mosaicism is likely while an autosomal dominant transmission also been discussed for diffuse partial woolly hair.

Patil et al.¹⁰ did trichoscopy done woolly hair and demonstrated a 'crawling snake' appearance of the hair. They linked appearance to the head of Mythical character Medusa.

Differential diagnosis includes acquired progressive curling of the hair, allatrichiacircumscripta symmetrical acquired paridin kinky hair and drug induced kinky hair.

The diagnosis observed by the symptoms and clinical presentations of the disease. Detailed systemic investi

gations, especially cardiovascular system, should be carried out to rule out various syndromes. Physical and chemical traumatic measures should be avoided. A thorough dermatological examination with an evaluation of the entire integument should be performed properly and also identify any associated manifestations. The examination of the hair should be light and electron microscopy reveals elliptical cross sectional variations in calibration and kinked formation, as well as non-homogeneous keratinization.

No treatment is currently observed. Depending on the hair size and location, woolly hair nevi can be excised. Harsh clinical and chemical cosmetic treatments should be avoided. If the presence of asymptomatic is suspected, an extensive internal investigation, with a detailed cardiological diagnostic examination is necessary.

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Conclusions

Woolly hair is a rare congenital abnormality of the structure of the scalp hair marked by extreme kinkiness of the hair. Woolly hair is usually tightly coiled overall or part of the scalp, in an individual part of origin. The clinical syndromes of which woolly hair is a feature has been signified by many authors. Woolly hair is most pronounced during childhood, the woolly hair is often becomes less severe in adulthood. Treatment of woolly hair is not currently known, although in some patients the hair may become darker and less curly with normal hair.

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Infantile Psoriasis: A Case Report

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Abstract

Psoriasis is a chronic inflammatory immunologically mediated dermatoses characterized by erythematous plaque covered by loosely adherent scales. Psoriasis in infant is a rare entity which may lead to psychological impairment and complications. Here we present a case of 1 year old girl with multiple erythematous scaly plaque over scalp, chest, back, arms as well as intertriginous areas. Punch biopsy from right upper arm showed microscopic features of psoriasis. This case is reported here due not only to its rarity but also to its therapeutic challenge.

Key Words: Psoriasis, Infant, Therapy

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Introduction

Psoriasis is a chronic inflammatory dermatoses characterized by erythematous plaques covered by loosely adherent scales which is mainly an immunologically mediated disorder¹. Infantile psoriasis is rare and accounts for only 3.5%-16% of childhood psoriasis²⁻⁵. Infantile psoriasis as compared with that of adults differs in many aspects such as epidemiology, clinical features, treatment, long term clinical and psychological outcome and hence requires special attention¹. Early diagnosis and appropriate medical therapy is necessary to prevent the affected infants from severe complications such as bacterial super infection, dehydration and sepsis⁶.

Case Report

A 1 year old girl presented in JIMCH skin department with itchy raised skin lesion over scalp, back, intertriginous areas and upper extremities since 9 months of age. On examination multiple coin shaped scaly plaques were noted over scalp, back, flexor of neck, axilla and upper arms sparing palm and soles [Fig-1A,1B]. Auspitz sign was positive but no nail abnormality was found. There were no family history of psoriasis and no maternal history of any drug intake. Punch biopsy is taken from right upper arm and microscopic examination showed hyperkeratosis, confluent parakeratosis, acanthosis with presence of monomicro abscess, focal thinning of suprapapillary epidermis,

dilated capillaries in the upper dermis with surrounding mixed inflammatory infiltrates. No malignancy or granuloma is seen [Fig-2,3]. Histopathological diagnosis was infantile psoriasis. Primary laboratory analysis of full blood count, ASO titre were within normal limit. Her throat swab culture was also done and show no growth of streptococcus.



Fig-1A



Fig-1B

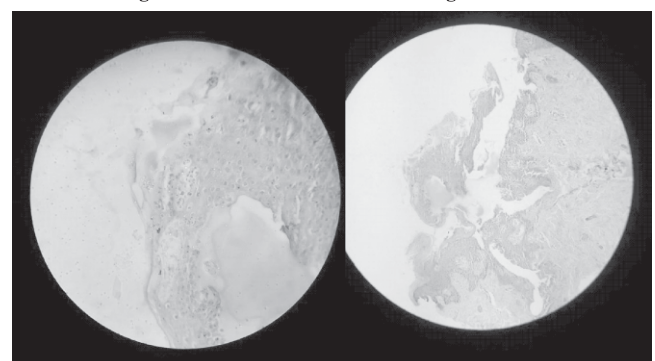


Fig-2

Fig-3

Discussion

The unique features of psoriasis are inflammation, chronicity, hyperproliferation. It is a relapsing papulosquamous disorder with abnormal hyperproliferation of epidermis that may present in infancy⁷. Infantile psoriasis may present with plaque type, guttate, erythrodermic, pustular, nail psoriasis, pityriasis amiantacea or Napkin dermatitis⁸. Plaque lesion found in infantile psoriasis are frequently pruritic, relatively softer, thinner and less scaly compared to adults⁹. Majority of Indian study show that infant manifest the established plaque variety more often rather than the guttate type⁹. In about two third cases of guttate psoriasis evidence of preceding streptococcal infection was found⁷. In our reported case there was no history of streptococcal infection. A study from northern India on 419 children (219 boys and 200 girls) with psoriasis, age ranged from 4 days to 14 years. The peak age of onset in boys was in the 6-10 years age group and girls was between 10-14 years. A positive family history was present in 4.5% patients³. In another study done by Manoharan et al the incidence of childhood psoriasis was 17.15%. The youngest patient was a male child 2 & 1/2 years old. Among female children, the youngest patient was 3 & 1/2 years old¹.

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In our reported case patient age at presentation was only 1 year and there were no positive family history or preceding infection, so that could be a rare case reported in that age group. Differential diagnosis of infantile psoriasis includes seborrheic dermatitis, Atopic dermatitis, Nummular dermatitis, Pityriasis rubrapilaris, Tinea capitis¹⁰. Infantile psoriasis is often more therapeutically challenging than atopic and seborrheic dermatitis¹¹. Initial medical therapy consist of bed rest, topical emollients, maintenance of adequate hydration, avoidance of excessive heat loss and use of mild to moderately potent topical corticosteroid¹². Other agents also found to be effective include topical calcipotriol (calcipotriene) and topical pimecrolimus^{11,12}, low dose narrow band ultraviolet-B (UV-B) phototherapy also found to be successful¹³. Systemic therapy with oral retinoids (Acitretin) and methotrexate have been described in infantile psoriasis who do not respond or who are refractory to conservative therapies, however these therapies have side effects¹⁴.

Conclusion

Though psoriasis in childhood is a well-known entity, its occurrence in 1 year old infant is uncommon. Disease may be cleared by initial therapy but relapse is frequent. Early recognition and management of psoriasis in infant is vital to prevent complications inherent to the disease.

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Jahurul Islam Medical Journal

Volume 15 Number 1

CONTENTS

January 2020

Editorial

- Covid-19 Pandemic: Still an unpredictable crisis** 1
Prof. Syed Mahmudul Aziz, Professor of Community Medicine, JIMC

Original Articles

- Electrolyte changes following phototherapy in neonatal Hyperbilirubinemia** 3
Ghosh UK, Parvin R, Sultana A, Rahman S, Afroze S, Haque MF
- A study on selective socio-demographic characteristics of patients of Enteric Fever in a tertiary care Hospital in Bangladesh** 14
Alam SM, Sultana T, Chowdhury AR, Amin RM, Kahhar MA
- Serum vitamin B 12 level in vitiligo patients: A case control study** 21
Sumi MN, Akter QS, Rahman H
- Effectiveness of topical tacrolimus(0.01%)in Treatment of vitiligo** 26
Roy P, Paul PC, Haque MM, Ajmery S
- Comparison of performance of Glasgow, BISAP & Ranson scores in Predicting Severity of Acute Pancreatitis** 31
Saqeb KMN

Case Reports

- Woolly hair-A rare entity** 40
Islam MS, Rikabder MMR, Hossain MI, Asgar N, Kabir MH, Biswas BP, Ahmed MNU
- Infantile Psoriasis: A Case Report** 43
Ahmed SS, Haque MM, Yousuf B, Ahmed SS, Islam M

Instructions to Author