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Professor & Head, Department of Cardiology
Dhaka National Medical College.
53/1, Johnson Road, Dhaka, Bangladesh
Email: journal@dnmc.edu.bd
Cell: +88 01711 486 147, 01715 421 423

Editorial

Zinc therapy in COVID-19: A new hope for Covid management

COVID-19 pandemic remains a substantial threat to entire healthcare system & disrupts the economy of high to low income countries globally. There is no specific antiviral therapeutic option to date available for COVID-19 management, so the preventive measure has been the mainstay to fight back the current COVID-19 infection. The host immune system plays pivotal roles against COVID-19 disease progression, similar to many other viral infections. Several vitamins such as vitamin A, B6, B12, C, D, E, and folate & microelements including zinc, iron, selenium, magnesium and copper play essential physiological roles in promoting the immune system.[1]

A recent study by Darnton-Hill reported that selenium, iron, potassium, sodium, calcium, magnesium, folic acid, copper and zinc play an important role in improving the immune physiology and patient recovers earlier and decrease the hospital stay among COVID-19 patients.[2] In support of that, several studies across the world advocated the importance of a balanced diet with relevant nutrients and trace elements especially zinc as a therapeutic option to build up robust immunity to fight back the COVID-19 pandemic.[3]

Zinc is a trace element which maintains cellular physiology like vision, taste perception, cognition, cell reproduction, growth and immunity.[4] Zinc deficits dampen equally innate and adaptive immune responses. Zinc deficiencies are evident by oxidant stress, increased inflammatory process, and life-threatening situations, as well as premature cell death at the cellular and sub-cellular levels.[5] Nuclear Factor Kappa B (NF-κB), a transcription factor known as the principal controller of the proinflammatory process, especially in infectious diseases, is also affected by zinc deficiency. Additionally, NF-κB controls several characteristics of innate and adaptive immune responses.[6]

Earlier studies reported that high dose zinc consumption has effectively boosted patients' immune systems with several viral diseases, including torquetenovirus (TTV), common cold (rhinovirus).[7] Since no approved effective treatment is yet available to minimize the current global pandemic's intensity, micronutrients like zinc, for its immune-boosting effect, and the antiviral mechanism is presumed to combat COVID-19 to some extent.[8]

There are few studies illustrate the efficacy of zinc therapy in managing COVID-19 patients. Many individuals globally consume zinc tablets, vitamin C, and B because of their immune booster & antiviral effects.[9] However, a recent pre-print United States-based retrospective analysis utilizing electronic medical records found that patients treated with hydroxychloroquine and azithromycin with the addition of zinc sulfate had a higher recovery rate. Interestingly, additional supplementation of zinc sulfate was claimed to be associated with lower mortality rate, decrease hospital stay, and less invasive ventilation requirements.[10]

Considering the pros and cons of the consumption of zinc supplements, particularly in elderly persons or those with certain metabolic diseases like diabetes, obesity or cardiovascular diseases, these views have supported the possibility of using zinc compounds as an adjunct therapy in COVID-19 treatment.[11]

However, double blind controlled clinical trials should be conducted on zinc therapy considering its antiviral and immunity boosting potency to recognize its possible role in prophylactic and an adjuvant in treatment against COVID-19.

Dr. Md. Maruf-Ur-Rahman
Associate Professor (CC)
Department of Biochemistry
Dhaka National Medical College

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J. Dhaka National Med. Coll. Hos. 2021; 27 (01): 07-11

Original Article

Synergistic action of Thyroxine & Vitamin B_{12} on Electrophysiological Changes in sensory functions of Median Nerve in Newly Diagnosed Hypothyroid Female

Farjana Ahmed[1], Nayma Sultana[2], Shyamal Chandra Banik[3], Md. Arifuzzaman Chowdhury[4]

[1]Assistant Professor, Department of Physiology, Dhaka National Medical College, [2]Professor, Department of Physiology, Sir Salimullah Medical College, [3]Assistant Professor, Department of Physiology, Dhaka National Medical College, [4]Assistant Professor, Department of Forensic Medicine, Popular Medical College

Abstract

Background: Synergistic action of thyroxine & vitamin B_{12} can improve the electrophysiological status of sensory function of median nerve in newly diagnosed hypothyroid patients.

Objectives: To observe the synergistic action of thyroxine & vitamin B_{12} on electrophysiological changes in sensory function of median nerve of newly diagnosed hypothyroid female.

Materials and Methods: This prospective interventional study was carried out in the Department of Physiology, Sir Salimullah Medical College (SSMC) between July' 2015 to June' 2016 on 40 newly diagnosed hypothyroid female patients. Among them, 20 patients received only thyroxine termed as HT-T_4 and another 20 patients received combined therapy of thyroxine with vitamin B_{12} termed as HT-C for 90 consecutive days. Nerve conduction parameters of sensory functions of median nerve were studied to observe the electrophysiological status and vitamin B_{12} level was also estimated to observe its level by using standard method. The statistical analysis was done by ANOVA test, paired, independent sample 't' test and Chi-square (χ^2) test.

Results: In this study, latency was significantly decreased, amplitude and NCV were significantly increased in sensory functions of median nerve of hypothyroid patients after 90 days supplementation of combined therapy of thyroxine with vitamin B_{12} in comparison to those of their pre-supplemented state and also to those of patients with only thyroxine treatment.

Conclusion: The present study revealed the combination of thyroxine with vitamin B_{12} can reduce the symptoms of hypothyroid and accelerate the nerve conduction velocity of sensory functions of median nerve more efficiently than the treatment with thyroxine alone.

Key words: Nerve conduction velocity, distal latency, amplitude, thyroxine, vitamin B_{12}.

Introduction

Hypothyroidism is a clinical condition resulting from reduced circulating levels of free thyroxine (FT_4) and triiodothyronine (FT_3).[1] However, the thyroid hormones increase the metabolic activities of almost all tissues of the body. The basal metabolic rate can increase 60 to 100 percent above normal when large amount of hormones are secrected.[2] The thyroid gland is not essential for life, but its absence or hypo function during fetal and neonatal life results in severe mental retardation and dwarfism.[3]

The prevalence of primary hypothyroidism is 10/1000 but increases to 50/1000 if patients with sub-clinical hypothyroidism (normal FT_4, raised TSH) are included and the female: male ratio is approximately 6:1.[4]

However, Hypothyroidism might be reversible at early stages; on the other hand irreversible cases might have longer duration of diseases or might present etiologies other than hypothyroidism. Long term accumulation of mucinous tissue is the possible cause of irreversibility.[5]

In hypothyroidism, delayed distal latencies with lower nerve conduction velocities were observed in median and ulnar nerves for both motor and sensory conduction, in peroneal nerves for motor conduction and in sural nerve for sensory conduction in nerve conduction study by using electromylogram machine.[6] Majority of the hypothyroid female patients with a diagnosis of polyneuropathy had electrophysiological evidence of prominent sensory neuropathy involving the median nerve.[7]

Most of the hypothyroid patients complain some sensory symptoms like tingling sensation, numbness, paraesthesia, burning pain and some motor symptoms like weakness, muscle fatigability, stiffness and cramp.[8] Again, decreased tendon reflexes, decreased muscle strength, positive Phalen's test and Tinel's sign at the wrist (test for clinical diagnosis of carpal tunnel syndrome) were also found in some hypothyrpod female.[9]

Some investigator revealed that, sensory and motor sign/symptoms such as tingling sensation, numbness, loss of vibration, pain, decreased muscle strength and delayed tendon reflexes were still persisted in hypothyroid patients even after 1 year of thyroxine replacement therapy.[10]

However, For clinical diagnosis of peripheral neuropathy, elicitation of reflexes, assessment of strength of major muscle groups on both side to evaluating motor system and fine/crude touch, two point discrimination test, pin prick, vibration sense to evaluating sensory system were observed in some study and they found the significant alteration in maximum newly diagnosed hypothyroid patients.[9]

After thyroxine therapy, the central and peripheral nerve conduction velocities returned to normal limits, whereas the abnormalities in amplitude were still persisted.[11]

In a follow-up study, some researchers demonstrated that abnormalities related to entrapment neuropathy and polyneuropathy in hypothyroid patients can be reversed within 3 months of thyroid hormone replacement therapy. But the researchers also found that, 13.8% of the patients still had carpal tunnel syndrome after 3 months of thyroxine replacement therapy and were subjected to surgical decompression.[7]

Methods

The present interventional study was carried out in the Department of Physiology, SSMC, Dhaka from 1st July 2015 to 30th June 2016. In this study, 40 newly diagnosed hypothyroid female patients with abnormal nerve conduction parameters (delayed distal latency, decreased amplitude and NCV) of sensory functions of median nerve, age ranged from 20-45 years were selected.

All the study subjects were selected from out patients department of SSMC and BSMMU belonged to middle socioeconomic status. Subjects with hypertension, diabetic Mellitus, heart disease, kidney disease, hyperthyroidism, past history of neuropathy or neuromuscular diseases, use of drugs known to cause neuropathy or myopathy, malignancy or other serious diseases, pregnancy or history of gastric or ileal resection were excluded from the study.

Among them, 20 hypothyroid patients before treatment with thyroxine termed as HT-T_{4b} received only thyroxine at a dose of 50 µg per day for 3wks, 100 µg per day for the next 3 wks and finally to a maintenance dose of 150 µg per day for the remaining day of the study period (upto day-90) and are termed as HT-T_{4a}

Another, 20 hypothyroid patients before treatment with thyroxine and vitamin B_{12} termed as HT-C_b received combined therapy of thyroxine (as above mentioned dose) with vitamin B_{12} (500µg 8 hourly orally) for 90 consecutive days and are termed as HT-C_a

All the patients were studied two times; on day 1 and on day 90. Furthermore, 20 euthyroid female subjects (ET) with normal electrophysiological status were taken for comparison and were studied only on day 1

Results

In this study, the mean (±SD) serum TSH level was higher and FT_4, FT_3 and vitamin B_{12} level were significantly (<0.001) lower in group HT-T_{4b} and HT-C_b in comparison to those of group ET. Whereas, the levels were almost similar and differences were not significant between group HT-T_{4b} and HT-C_b (Table-1).

Again, TSH level was decreased, whereas FT_4 and FT3 levels were increased in group HT-T4a and HT-C_a in comparison to those of group HT-T_{4b} and HT-C_b respectively and vitamin B_{12} level was increased only in group HT-C_a in comparison to that of group HT-C_b and HT-T_{4b} respectively (Table-1).

However, FT_4 level was almost similar and the difference was not significant between groups HT-T_{4a} vs HT-C_a, ET vs HT-T_{4a} and ET vs HT-C_a. Again, TSH level was lower, whereas FT_3 level was higher in group HT-T_{4a} and HT-C_a in comparison to those of group ET (Table-1).

But, these levels were almost similar and the differences were not significant between groups HT-T_{4a} vs HT-C_a.

Again, Vitamin B_{12} level was reached towards the level of group ET, though this level still showed difference between ET vs HT-C_a (Table-I)

In this study, the M d latency was significantly ($p<0.01$) higher whereas, M amplitude and MNCV were significantly ($p<0.001$) lower in group HT-T_{4b} and HT-C_b when compared to those of group ET. However, these levels were almost similar and the differences were not statistically significant between group HT-T_{4b} and group HT-C_b (Table-1I).

Again, M d latency was significantly ($p<0.01$) decreased and M amplitude was significantly ($p<0.01$) increased in group HT-T_{4a} and HT-C_a in comparison to those of HT-T_{4b} and HT-C_b respectively. However, these levels in group HT-T_{4a} and HT-C_a projected towards the levels of group ET, though the differences among them were still statistically significant ($p<0.05$, $p<0.01$).Whereas, these levels were almost similar and the differences were not statistically significant between HT-T_{4a} and HT-C_a (Table-II).

Moreover, MNCV was significantly ($p<0.01$) increased in group HT-C_a when compared to that of groups HT-C_b and HT_{4a}.

However, this level in group HT-T_{4a} projected towards the level of group ET, though the differences between ET vs HT-C_a was still statistically significant ($p<0.05$) (Table-1I)

Table-I: Serum Thyroid Stimulating Hormone (TSH), free Thyroxine (FT_4), free Triiodothyronin (FT_3), and Vitamin B_{12} levels in different groups (n=60)

Groups	n	TSH (μIU/ml)	FT_4 (pmol/L)	FT_3 (pmol/L)	Vitamin B_{12} (pg/ml)
ET	20	1.28±0.8	13.87±1.53	3.2±0.44	275±4,2
		(0.3-2.6)	(12.2-14.5)	(2.2-4.4)	(261-285)
HT-T_{4b}	20	8.99±1.74	9.8±1.5	1.4±0.4	235±4.6
		(5.9-11.4)	(7.4-13.4)	(1-1.9)	(220-245)
HT-T_{4a}	20	4.06±0.5	13.6±0.9	2.3±0.6	235± 3.7
		(3.3-4.9)	(12.4-14.5)	(1.8-2.7)	(230-240)
HT-C_b	20	9.56±2.1	10.67±3.05	1.5±0.4	234±5.2
		(5.8-13.2)	(6.5-16.2)	(1.0-2.2)	(230-238)
HT-C_a	20	4.32±0.6	12.92±0.53	2.2±0.4	250±5.4
		(3.4-5.5)	(11.52-13.8)	(1.5-3.1)	(244-256)

Data were expressed as mean ± SD. For statistical analysis, one way ANOVA, paired 't' test and independent sample 't ' test were done. Figures in parentheses indicate ranges.

Group ET: euthyroid subjects

Group HT: hypothyroid patient (**HT-T_{4b}**: before treatment with thyroxine , **HT-T_{4a}**: after treatment with thyroxine , **HT-C_b**: before treatment with thyroxine and vitamin B_{12} , **HT- C_a:** after treatment with thyroxine and vitamin B_{12})

Table-II: Nerve conduction parameters for sensory function of median nerve in different groups (n=60)

Groups	n	M d latency (msec)	M amplitude (μv)	M NCV (m/sec)
A	20	2.4±0.2	26.26±3.8	61±5.4
		(2.02-2.9)	(20.2-33.5)	(50-69)
B_{1b}	20	4.4±0.5	18.9±3.5	37±7.5
		(3.6-5.2)	(15-21)	(30-48)
B_{1a}	20	3.2±1.7	19.9±3.9	38±4.8
		(2.7-4.6)	(16-23.5)	(34-42)
B_{2b}	20	4.6±1.2	18.5±5.4	38±6.9
		(2.6-6.6)	(15-21)	(33-41)
B_{2a}	20	2.8±1.02	26.23±4.7	52±4.6
		(1.2-3.8)	(20-31.5)	(44-58)

Statistical analysis

Groups	M d latency (p value)	M amplitude (p value)	MNCV (p value)
A vs B_{1b} vs B_{2b}	0.000***	0.000***	0.000***
A vs B_{1b}	0.000***	0.000***	0.000***
A vs B_{2b}	0.000***	0.000***	0.000***
B_{1b} vs B_{2b}	0.221^{ns}	0.311^{ns}	0.112^{ns}
B_{1a} vs B_{2a}	0.051*	0.000***	0.001**
B_{1b} vs B_{1a}	0.012*	0.504^{ns}	0.201^{ns}
B_{2b} vs B_{2a}	0.000***	0.000***	0.001**
A vs B_{1a}	0.031*	0.001**	0.001**
A vs B_{2a}	2.456^{ns}	1.286^{ns}	0.023*

Data were expressed as mean ± SD. For statistical analysis, one way ANOVA, paired't' test and independent sample 't ' test were done. Figures in parentheses indicate ranges.

Group-A: euthyroid subjects

Group-B: hypothyroid patients

B_{1b}: before treatment with thyroxine

B_{1a}: after treatment with thyroxine

B_{2b}: before treatment with thyroxine and vitamin B12

B_{2a}: after treatment with thyroxine and vitamin B12

***= Significant at P<0.00 **= Significant at P<0.01 *= Significant at P<0.05

ns = not significant n= total number of subjects

M d latency=Median Distal Latency, **M Amplitude**=Median Amplitude, **MNCV**=Median Nerve Conduction Velocity.

Discussion

In the present study, the mean (±SD) serum TSH level was significantly ($p<0.001$) higher and FT_4 and FT_3 levels were significantly (<0.001) lower in both groups of hypothyroid female in the comparison to those of ET group. However, after supplementation, TSH level was significantly ($p<0.01$) decreased, whereas FT_4 and FT_3 levels were significantly ($p<0.01$, $p<0.001$) increased in both groups of HT female patients on day 90 in comparison to those of their pre-supplemented states on day 1. However, these levels were almost similar and the differences were not statistically significant between these two groups on day 90. Again, FT_4 level reached to the level of ET group after 90 days supplementation with combined therapy of thyroxine along with vitamin B_{12}.

Electrophysiological Status

Sensory function of median nerve

In this study, the mean distal latency of median nerves (M d latency) was significantly decreased ($p<0.001$) and median amplitude (M amplitude) and nerve conduction velocity (MNCV) were significantly ($p<0.01$) increased in newly diagnosed HT female patients after supplementation with combined therapy of thyroxine along with vitamin B_{12} in comparison to those of their pre-supplemented state ($HT\text{-}C_b$) and also of only thyroxine group ($HT\text{-}T_{4b}$). Again, significant decreased value of M d latency and significant increased value of M amplitude with no significant change of MNCV were observed in only thyroxine group ($HT\text{-}T_{4a}$) in comparison to those of their presupplemented state ($HT\text{-}T_{4n}$). Almost similar type of findings were observed by some others researchers in pateints who suffered from uremic neuropathy and supplemented with only vitamin B_{12} for 6 months.[12]

Different investigators have suggested some mechanism responsible for defective sensory nerve conduction in HT patients. The mechanism involved in the development of neuropathy in hypothyroidism still remains unclear. Some investigator suggested that the weight gain in HT may be the contributory factors for the nerve conduction abnormalities.[12] The increased body weight and BMI in HT might be due to accumulation of mucopolysaccharides, hyaluronic acid and chondroitin sulphate in the interstitial spaces which, because of their hydrophilic nature retain water along with them resulting in weight gain.[4] In addition, decreased rate of basal metabolism also causes increased body weight in HT.[2]

On the other hand, an overall slowness in all metabolic pathways is seen in HT. Due to the reduction of the carbohydrate metabolism, glycosaminoglycans cannot be broken down; instead accumulate in the entrapment regions leading to entrapment neuropathy.[13]

HT produces alteration of fluid balance and peripheral tissue edema, which may lead to carpal tunnel syndrome (CTS) development.[14]

It has been suggested that CTS in hypothyroidism develops as a result of the mucinous infiltration in the perineurium and endoneurium of median nerve. The increased pressure as results of this infiltration is transferred to the median nerve and causes focal demyelination.[15]

However, long term accumulation of mucinous tissue is a possible cause of irreversibility of CTS to replacement theraphy.[5] Again, the cause of irreversibility to replacement therapy in hypothyroid patients may be related to duration and severity of illness and also to treatment regimens.[5]

Moreover, some researchers also explained that, deposition of glycosaminoglycans in nerves and soft tissues surrounding them with resultant axonal degeneration and segmental demyelination forms the pathological basis of alteration in peripheral nerve function in thyroid hormone deficiency.[16]

HT may affect the multiple peripheral nerves of our body. Depresses the gene activation for synthesis of myelin basic protein, required for myelination thereby causes impairment of nerve conduction velocities as well as loss of tendon reflexes.[17]

In HT, most frequent cause of peripheral nerve damage is median nerve entrapment at wrist but sensory-motor polyneuropathy such as ulnar, common peroneal and sural neuropathy can also be seen.[18]

However, the mononeuropathy i.e. involvement of single nerve may be secondary to compression due to deposition of myxedematous tissue and the polyneuropathy i.e. involvement of more than one nerve may be due to either a demyelinating process or the axonal degeneration. The combination of both this two factors results in the development of the peripheral neuropathy.[19]

Conclusion

From the result of the study, it can be concluded that, peripheral neuropathy along with deficiency of vitamin B_{12} was observed in newly diagnosed hypothyroid female before starting their treatment.

However, after treatment with T_4 alone can improve peripheral nerve conduction parameters to some extent in newly diagnosed hypothyroid.

But, combined therapies of T_4 with vitamin B_{12} have synergistic effects on sensory functions of peripheral nerve by improving all the parameters of electrophysiological study.

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Original Article

Estimation of stature from length of the radius and length of the ulna-An anthropometric study on adult Bangladeshi women

Khushruba Rahman Khan[1], Shyamal Chandra Banik[2], Farhana akter[3], Md Razaul Huq[4], Humaira Naushaba[5]

[1]Associate professor(cc), Department of Anatomy, Dhaka National Medical College, Dhaka, [2]Assistant Professor, Department of Physiology, Dhaka National Medical College, Dhaka, [3]Associate professor(cc), Department of Anatomy, Dhaka National Medical College, Dhaka, [4]Assistant Registrar, Department of Skin and VD, Dhaka National Medical College Dhaka, , [5]Professor and Head, Department of Anatomy, Green Life Medical College, Dhaka.

Abstract

Background: The upper limb is unique both structurally and functionally. It is the most movable part and main working tools of human body which is used for maintaining balance, carrying, touching, cognition, holding, gripping and for performing various fine works.

Objectives: To determine the upper limb dimensions of the adult Bangladeshi women.

Methods: This descriptive and analytical study was carried out in the department of Anatomy, Sir Salimullah Medical College, Dhaka from July 2010 to December 2011. The ethical permission was taken from Institutional Ethics Committee (IEC) of SSMC. Total 100 adult Bangladeshi women of 25 to 45 years were studied. Length of radius & ulna were measured directly from the subjects by using anthropometric spreading caliper. Statistical analysis was done by two sample z-test & pearson correlation coefficient test.

Result: The length of both right & left radius and also both right & left ulna showed significant positive correlation with stature.

Conclusion: This study provides the direction to construct baseline data of upper limb anthropometry of adult Bangladeshi women.

Key words: Anthropometry, Hand length, Stature.

Introduction

Anthropometry is the science that deals with the measurement of size, weight and proportion of the human body. This was adapted by medical scientists to estimate the body size for over a hundred years.[1] It is used to assess health, survival of individuals and reflect the economic and social well being of populations. Anthropometric measurements are now regarded as important indicators of an individual's nutritional status. The anthropometric measurements most commonly used for assessing nutritional status are height, body weight, mid-arm circumference.[2] Stature is a component of measurement of body mass index (BMI).[3] Upper limb is the most movable part and main working tools of human body. It is used for maintaining balance, carrying, touching, cognition, holding, gripping and for performing various fine works. Process of measurement of upper limb is called upper limb anthropometry which includes measurement of shoulder, arm, forearm and hand region of human body.[4] In this particular study stature, length of the radius, length of the ulna have been measured. The anthropometric values of upper limb are helpful to anatomists for normative reference. The upper limb normative values are helpful to plastic and reconstructive surgeons for the treatment of congenital and traumatic anomalies.

Materials & Methods

This descriptive analytical study was carried out on 100 adult Bangladeshi women in the Department of Anatomy, Sir Salimullah Medical College (SSMC), Dhaka and was conducted from July 2010 to December 2011. To measure the stature the subject was said to stand with her heel together and her back as straight as possible so that her heels, buttocks, shoulders and the head pressed against the upright position of the

instrument (Stadiometer). The arms were hung freely by the sides with the palm facing the thighs. The subject's head was positioned in the Frankfort horizontal plane, and the head plate was brought in contact with vertex in the mid saggital plane and then readings were taken to the nearest 0.1 cm (Figure-I). Length of forearm (radius) was measured by spreading caliper from behind. The subject was asked to stand erect with her feet together and then she was asked to extend her elbow and reveal a well marked depression to the lateral side of the mid line. This depression contains head of the radius at the lower part. This could be felt to rotate when forearm was pronated and supinated. From this point the caliper was extended down the posterior surface of the forearm to the tip of the most distal point on the styloid process of the radius.[5] The measurement was recorded in centimeters to the nearest 0.5 centimeters (Figure II). Length of ulna was measured by spreading caliper from the level of the tip of the olecranon process to the tip of the most distal point on the styloid process of the ulna and recorded in centimeters to the nearest 0.5 centimeters. The length was obtained in the sitting position with the forearm resting comfortably on a table. The palm faced downwards and the fingers were extended but together. The elbow was bent at 90° to 110°.The proximal end of the ulna was found by palpating along its entire length. The tip of the styloid process was felt at the wrist by palpating down the length of the bone distally, until its end was felt.[6] (Figure III)

Regression formula is used for estimation of the stature from anthropometric measurements of radius & ulna.

Stature = value of constant + regression coefficient x variable.

Value of the constant and the regression coefficient for each variable was calculated using SPSS version 16.0 program.[7]

Data processing and analysis

The data were put into the computer. Then the data were analyzed with the help of SPSS version 16.0 for Windows program keeping in view the objective of the study. Pearson's correlation coefficient test was performed to measure the relationships between the variables and two-sample Z-test was performed to compare between means.

Figure I(A): Procedure for measuring stature (Stadiometer)

Figure I(B): Procedure for measuring stature (Stadiometer)

Figure-II: Procedure for measuring the length of radius using a spreading caliper

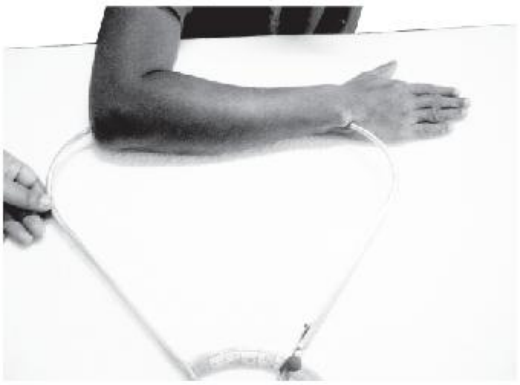

Figure-III: Procedure for measuring the length of the ulna by using the spreading caliper

Result

The mean (±SD) stature was found 149.61±5.07cm. The length of the right radius varied from 19.18 to 23.50 centimeters as shown in Table-I. In more than 75% of the subjects, the length of right radius was between 18.5 and 21.5 cm (Figure-IV). The length of right radius also showed significant positive correlation (r=0.340, p=0.001) with the stature (Table-I). The length of left radius varied from 18.19 to 23.00 centimeters as shown in Table-I. In more than 75% of the subjects, the length of left radius was between 18.5 and 21.5 cm (Figure-V). The length of left radius also showed significant positive correlation (r=0.237, p=0.018) with the stature (Table-I). The length of the right ulna varied from 20.50 to 25.00 centimeters as shown in Table-I. In more than 75% of the subjects, the length of the right ulna was between 21.50 and 24.50 cm (Figure-VI). The length of the right ulna also showed significant positive correlation (r=0.202, p=0.044) with the stature (Table-I). The length of the left ulna varied from 19.48 to 24.50 centimeters as shown in Table-I. In more than 70% of the subjects, length of the left ulna was between 21.50 and 24.50 cm (Figure-VII). The length of the left ulna also showed significant positive correlation (r=0.198, p=0.048) with the stature (Table-I).

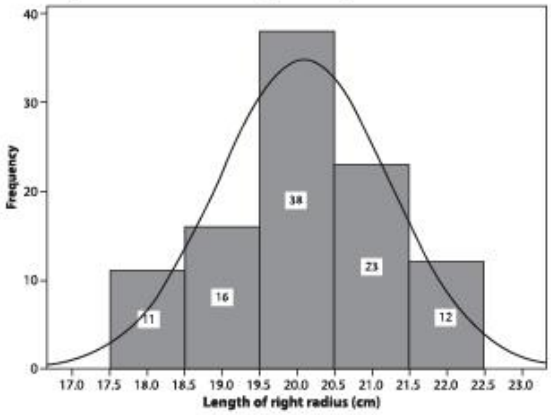

Figure-IV: Histogram showing the frequency distribution of length of right radius (n=100).

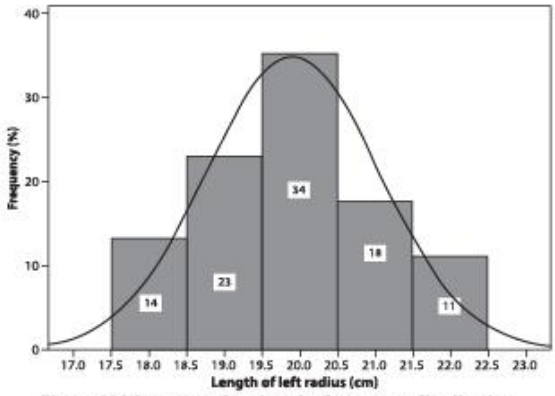

Figure-V: Histogram showing the frequency distribution of length of left radius (n=100).

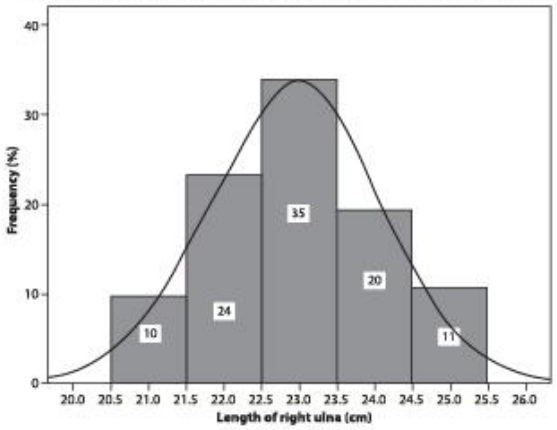

Figure-VI: Histogram showing the frequency distribution of length of right ulna (n=100).

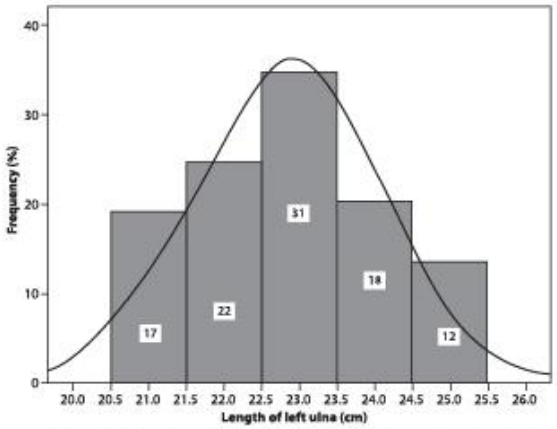

Figure-VII: Histogram showing the frequency distribution of length of left ulna (n=100).

Table-I: Stature and various physically measured upper limb dimensions with corresponding constant and regression co-efficient

Variables		Measurement		Constant	Regression Co-efficient (B)	Correlation with stature	
		Range (cm)	Mean (cm)±SD			R	P
Stature		141 - 160	149.61±5.07				
Length of radius	Right	19.18 - 23.50	21.13±0.98	112.39	1.76	.340*	.001 (S)
	Left	18.19 - 23.00	20.49±1.05	126.09	1.15	.237*	.018 (S)
Length of ulna	Right	20.50 – 25.00	22.45±1.00	126.63	1.02	.202*	.044 (S)
	Left	19.48 – 24.50	21.68±1.04	131.63	0.83	.198*	.048 (S)

** = Correlation is significant at the 0.01 level (2-tailed),* = Correlation is significant at the 0.05 level (2-tailed), S = Significant, NS = Non significant

Table-II: Calculated* stature and their relationships with the measured stature

Variables	Range	Mean ± SD	Significance of difference between calculated stature and physically measured stature (Z-value)
Stature	141.00 – 160.00	149.61 ± 5.07	
Calculated stature (cm)			
Length of right radius	146.15-153.75	149.58 ± 1.72	0.001 (NS)
Length of left radius	144.40-152.87	148.45 ± 1.84	0.008 (NS)
Length of right ulna	147.54-152.13	149.53 ± 1.02	0.018 (NS)
Length of left ulna	147.80-151.96	149.62 ± 0.87	0.018 (NS)

NS= Non-significant at 5% level of significance on two-sample Z-test. n=100 for each variable

* The calculated stature against each variable was obtained by using regression equation (stature= constant+ regression co-efficient x variable)

Table-II shows the range and mean calculated stature (±SD) from physically measured different upper limb variables with their difference with the measured stature with level of significance, significance of difference was tested using the two sample Z test at 95% level of significance (p=0.05). No significant difference was found between the measured and calculated stature from the length of radius, length of ulna (Table-II).

Discussion

The present study was conducted on different upper limb dimensions of one hundred adult Bangladeshi women. The stature, length of radius and length of ulna were measured by direct physical methods. The study was designed to get normative values of the variables for the adult Bangladeshi women, to observe the possible correlation between physical measurements and photographic measurements with the stature. Difference between right & left radius and ulnar dimensions were observed. Regression co-efficient and constant of all the physical variables for estimating the stature were also tried to be estimated from the obtained measurements of the physical and photographic variables. Significance test was done between calculated and observed values. The mean (±SD) stature of the present study was similar to that of India,[8] and Malawian.[9] The food habit (plenty of carbohydrate and less protein) of Malawian, Indian people and that of people of Bangladesh are similar. The result of this study did not coincide with people of Ethopians,[10] Punjab,[11] Jordan,[12] Australian,[13] Indian,[14] South Indian,[15] Malawian,[16] Thailand,[17] North Indian,[18] American[19] where the mean (±SD) value of stature were higher than the result of the present study. The mean length of the radius and length of the ulna of German people[20] coincided with the present study. The mean length of the radius and length of the ulna of South African Whites,[21] American[22] female of same age group were higher than that of the present study.

Conclusion

The present anthropometric study may provide the direction to construct baseline data on different dimensions of upper limb of adult Bangladeshi female. In the present study, the right upper limb dimensions showed variations with the left side but it was statistically non significant. The dependent variables (stature) were calculated using the regression formula from the independent variables showing significant positive correlation. There was no significant difference between the observed and the calculated measurements.

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Original Article

Status of Glucose-6 Phosphate Dehydrogenase Enzyme in Patients with Hemolytic Anemia

Razzak M[1], Begum N[2], Hossain MD[3]

[1]Professor (c.c), Department of Physiology, Dhaka National Medical College, Dhaka, [2]Professor, Department of Physiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, [3]Associate Professor (c.c), Department of Pathology, National Institute of Diseases of the chest and Hospital, Mohakhal, Dhaka.

Abstract:

Background: Glucose-6 Phosphate Dehydrogenase (G-6PD) enzyme deficiency is an important cause of hemolytic anemia. Acute hemolytic crisis may occur in G-6PD enzyme deficiency due to some oxidative stress. Hemolysis of RBC may occur even without prior administration of drugs in patients with G-6PD enzyme deficiency. Erythrocyte and serum level of G-6PD enzyme are lower in most of the patients with hemolytic anemia

Objectives: To assess the status of erythrocyte and serum level of G-6PD enzyme in patients with hemolytic anemia.

Method: The cross sectional study was carried out in the Department of physiology, BSMMU, Dhaka from July 2002 to 2003 to observe the status of Glucose-6 Phosphate Dehydrogenase (G-6PD) enzyme in patient with hemolytic anemia. For this, total number of 50 hemolytic anemic patients (Groups-B) with age ranged from 5 to 30 years of both sexes was studied. Among them, 25 were without G-6PD deficient hemolytic anemia (group-B1) and 25 were hemolytic anemia with G-6PD deficiency(group-B2).Age and sex matched 30 apparently healthy subjects with normal blood G-6PD were included to observe baseline data (Group-A) and also for comparison. The subject was selected from out Patient Department of Hematology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka. Blood erythrocyte and serum levels of G-6PD enzyme level were measured by standard laboratory techniques. Analysis of data was done by unpaired student't' test.

Results: Both erythrocyte and serum level of G-6PD enzyme levels were significantly lower in patients with hemolytic anemia.

Conclusion: Erythrocyte and serum level of G-6PD enzyme may play important role in the diagnosis of hemolytic anemia with or without G-6PD enzyme deficiency and may help in prompt patient management.

Key words: Glucose-6 Phosphate Dehydrogenase Enzyme, Hemolytic Anemia.

Introduction:

Hemolytic anemia may be defined as anemia resulting from an increase in the rate of red cell destruction.[1] Erythrocyte of G-6PD enzyme deficiency is an important cause of hemolytic Anemia.[2] Acute hemolytic crisis may occur in G-6PD enzyme deficiency due to some oxidative stress, such as intake some anti–malarial drugs, Ingestion of Feva beans, and various types of bacterial & viral infection.[3-5] Hemolysis of RBC may occur even without prior administration of drugs in G-6PD enzyme deficiency.[6-8] It can also lead to life threatening hemolytic crisis in childhood and advanced age by interacting with specific drugs.[9] Hemolytic anemia induced by drugs is more common in patients with erythrocyte G-6PD enzyme deficiiency.[10] Erythrocyte enzyme concentration has been significantly lowered in hemolytic anemia suffering from any type of infection.[11] Again, when erythrocyte G-6PD enzyme efficiency its present usually more marked hemolysis occurs in this group of anemic patients.[12] On the other hand, oxidative stress, ingestion of certain drugs also causes marked hemolysis in similar group of enzyme deficient patients with hemolytic anemia.[13]

In hemolytic anemia erythrocyte G-6PD enzyme is significantly lowered during acute infection.[14] Erythrocyte and serum level of G-6PD enzyme were

lower in most of the patient with hemolytic anemia, while it remained normal in some cases.[15] on the other hand, the invesgators of different countries reported that erythrocyte and serum level of G-6PD enzyme has been decreased after prolong use of oxidative drugs.[16-17]

In Bangladesh, many people are suffering from hemolytic anemia due to erythrocyte G-6PD enzyme deficiency. Unfortunately, most of them are treated without knowing the underlying cause. In our country, there is lack of adequate information about deficiency of erythrocyte G-6PD enzyme in the hemolytic anemic patients and a few published data regarding the effects of erythrocyte G-6PD enzyme deficiency patients are available in our country.[18,19] and also from other countries.[14, 15]

Therefore, the present study was under taken to hemolytic anemic patients with and without erythrocyte G-6PD enzyme deficiency. The outcome of the study may be helpful to create awareness among the clinicians about the needful in avoiding various complications due to this deficiency in hemolytic anemia.

Methods

the present cross-sectional study was carried out in the department of Physiology, BSMMU, Dhaka from July 2002 to 2003. For this, a total number of 80 subjects with age range from 5 to 30 years of both sexes were included. Among them, 50 patients with hemolytic anemia were included in Group B.On the basis of G-6PD enzyme level subject B were further divided into Group B1, consisted of 25 patients without this enzyme deficiency and Group B2 consisted of 25 patients with this enzyme deficiency .Age and sex matched 30 apparently healthy subjects with normal blood G-6PD enzyme level were taken to observe the baseline data (control) and also for comparison. All the G-6PD enzyme deficient and non deficient patients were selected from personal contact. Patients with acute hemolytic episode or receive blood transfusion in the last 2 months and the thalassemia trait were excluded from the study. For all the subjects, 2 ml of blood was taken in an EDTA test tube for determination of erythrocyte and serum G-6PD enzyme level. Erythrocyte G-6PD enzyme level was determined by spectrophotometric method20. All of these tests were done in the Department of Hematology, BSMMU, Dhaka. Data were expressed as Mean±SE. Statistical analysis of the results were done by unpaired Student t test by using SPSS program version 12.

Results

Mean erythrocyte G-6PD enzyme level was significantly ($P<0.001$) lower in G-6PD enzyme deficient group (G-6PD enzyme deficiency) than that of healthy control (Group A) and hemolytic anemia without G-6PD enzyme deficiency (Group B1).

Table-I: Erythrocyte Glucose-6 Phosphate Dehydrogenase Enzyme level in different groups of subjects (n=80)

Groups	n	RBC level (Mu/109erythrocyte) Mean(±SE)
A	30	119.79±1.69
		(101.60-140.20)
B_1	25	130.42 ±2.80
		(109.00-168.30)
B_2	25	41.28±3.99
		(16.40-91.10)

Statistical Analysis			
Groups	**df**	**t-value**	**P-value**
A vs B_1	53	-5.01	<0.001***
A vs B_2	53	18.76	<0.001***
B1 vs B_2	48	-18.30	<0.001***

Data were expressed as mean ± SE. Figures in parenthesis indicate ranges.

Group A: Apparently healthy subject

Group B_1: Hemolytic Anemia without G-6PD deficiency

Group B_2: Hemolytic Anemia with G-6PD deficiency

Table-II: Serum Glucose-6 Phosphate Dehydrogenase Enzyme level in different groups of subjects (n=80)

Groups	n	Serum Glucose-6 PD level(mU/ml) Mean(±SE)
A	30	14.01±0.24
		(11.77-16.82)
B_1	25	7.83-.50
		(3.36-11.77)
B_2	25	5.73±.53
		(2.50-12.60)

Statistical Analysis			
Groups	**df**	**t-value**	**P-value**
A vs B_1	53	11.84	<0.001***
A vs B_2	53	15.12	<0.001***
B_1 vs B_2	48	-2.90	<0.01***

Data were expressed as mean ± SE. Figures in parenthesis indicate ranges.

Group A: Apparently healthy subject

Group B_1: Hemolytic Anemia without G-6PD deficiency

Group B_2: Hemolytic Anemia with G-6PD deficiency

Discussion:

The patients with G-6PD enzyme deficiency had significantly lower both erythrocyte and serum level of G-6PD enzyme level in comparison to those of healthy control. These findings are consistent with those of some investigators of different countries.[23] On the other hand, erythrocyte and serum level of G-6PD enzyme level had significantly lower in patients without G-6PD enzyme deficiency than that of healthy control. These findings had also been reported by some other group investigators.[24] The erythrocyte and serum level of G-6PD enzyme level had significantly lower in patients with and without G-6PD enzyme deficiency due to excessive destruction of affected erythrocyte.[25]

Changes in red cell membrane integrity may be the possible cause of early destruction of RBC in G-6PD enzyme deficient in hemolytic anemia.[26] It has been suggested that abnormal degradation of hemoglobin may occur in G-6PD enzyme deficient hemolytic anemia.[27] Disturbance of intracellular metabolism may of also be the another possible underlying cause in this type of hemolytic anemia.[16]

Extensive studies on the occurrence of severe anemia in Erythrocyte G-6PD enzyme deficient patients indicate that such erythrocyte are prone to rapid and easy destruction by reticuloendothelial system. Abnormal degradation of hemoglobin, disturbances in intracellular metabolism or changes in membrane integrity is the possible underlying causes of early destruction of Erythrocyte G-6PD enzyme deficient erythrocyte in hemolytic anemia.

It is known that Erythrocyte depends upon the pentose monophosphate shunt for the production of energy to drive various associated cell processes and Erythrocyte G-6PD initiates this pathway. A deficiency of this enzyme leads to lower level of reduced hemoglobin, glutathione or NADPH.As a result, intracellular stability of the affected erythrocytes may be impaired due to disturbances metabolism and such cells undergo destruction more rapidly than normal cell.[26] In addition, it has also the lower level of reduced glutathione Erythrocyte G-6PD enzyme deficiency erythrocytes limit their ability to resist oxidative stress and leads to premature destruction.so,the deficiency of the enzyme leads to more hemolysis, though the exact mechanism involved for this markedly increased hemolysis is not clear, it appears to be due to changes in the erythrocyte membrane permeability that tenders it more susceptible to destruction.[27] Again Erythrocyte G-6PD enzyme is essential for maintain of the integrity of red cell membrane. Erythrocyte G-6PD enzyme deficiency might lead to more hemolysis. This is supported by markedly lower level in hemolytic anemic Erythrocyte G-6PD enzyme deficiency. Additionally changes in erythrocyte membrane characteristics as a result of oxidative damage may also act as a causative factor for erythrocyte life span.

All the above mentioned suggestions may also be the underlying cause of excess hemolysis of RBC in the G-6PD enzyme deficient hemolytic anemic patients of present series. But it is difficult to comment on all the above mentioned factors as they were not studied.

Conclusion

Therefore, this study concludes that in G-6PD enzyme deficiency, excess hemolysis of RBC occur possible due to membrane defect.

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Original Article

Severity of pain according to Visual Analog Scale in adhesive capsulitis patients

Mohammad Hosain[1], Sohely Rahman[2], Farhana Islam[3], S.M. Mazharul Islam[4],Tahmeen Sultana[5], Md. Mubdiur Rahman[6], Shamima Sattar[7]

[1]Medical officer, Department of Physical Medicine and Rehabilitation, BSMMU, [2]Professor and Head, Department of Physical Medicine & Rehabilitation, DMC, [3]Senior Lecturer, Department of Pharmacology, DNMC, [4]Assistant Professor, Department of Physical Medicine & Rehabilitation, DMC, [5]Senior Lecturer, Department of Pharmacology, DNMC, [6]Assistant Registrar, Department of Physical Medicine & Rehabilitation, MMC, [7]Associate Professor, Department of Pharmacology, CBMCB.

Abstract:

Objective: The aim of the present study was to assess the severity of pain according to visual analog scale in adhesive capsulitis patients with DM.

Methods: A descriptive, cross sectional study was conducted from January 2019 to June 2019 among 200 patients attending at Physical Medicine and Rehabilitation Department, Bangabandhu Sheikh Mujib Medical University after obtaining requisite consent from the patients. Purposive sampling was adopted for collecting data. Data were collected through the assessment of patients in the Outpatient Department. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the severity of pain according to visual analog scale in adhesive capsulitis patients. The study was approved by the institutional ethical committee.

Results: Mean age of patients with adhesive capsulitis was 54.85±9.35 years. Among 200 DM patients, majority (35%) was between 51-55 years. Among 200 patients 61% was female and 39% was male. Among the DM patients 54(27%) had adhesive capsulitis, and 146(73%) did not have adhesive capsulitis. Female patients (65%) suffered from more adhesive capsulitis of shoulder than male patients (35%). Most of the adhesive capsulitis patients suffering from moderate type of pain which visual analogue score is 4-6.

Conclusion: Overall frequency of adhesive capsulitis of the shoulder among diabetic individuals attending in physical medicine and rehabilitation department of a tertiary care hospital was 27%. Most of the adhesive capsulitis patients suffering from moderate type of pain which visual analogue score is 4-6.

Keywords: Adhesive Capsulitis, Diabetes mellitus, Visual analogue scale.

Introduction

Adhesive capsulitis is a well-defined disorder characterized by progressive pain and stiffness of the shoulder which usually resolves spontaneously after about 18 months.[1] The patients typically present with progressive painful restriction in range of movement of the glenohumeral joint without any preceding trauma. They exibit a capsular pattern of restriction with external rotation being the most restricted followed by abduction in the plane of the scapula and then flexion.[2] Diabetes mellitus is a chronic metabolic condition characterised by persistent hyperglycaemia with resultant morbidity and mortality related primarily to its associated microvascular and macrovascular complications.[3] There is a well-documented relationship between adhesive capsulitis and diabetes mellitus. 10.8% diabetics and 2.3 % non-diabetics were found to have periarthritis of the shoulder, a statistically significant difference between the two groups of patients ($P<0.005$).[4] There were three consecutive stages: pain, stiffness, and recovery. The stiffness stage was usually related to the duration of the recovery stage. The total duration was longer than is generally supposed (an average total of 30.1 months in contrast to about 18 months as often postulated). Generally speaking, the longer the stiffness stage is the longer is the recovery stage.[5] The visual analog scale (VAS) is a validated, subjective measure for acute and chronic pain. Several studies have been conducted worldwide, a small number of study has been found in Bangladesh. Considering the importance of the topic, the study was designed to estimate the severity of pain according to visual analog scale in adhesive capsulitis patients with DM in a tertiary care hospital.

Materials & methods

A descriptive, cross sectional study was conducted from January 2019 to June 2019 among 200 patients attending at Physical Medicine and Rehabilitation Department, Bangabandhu Sheikh Mujib Medical University after obtaining requisite consent from the patients. Purposive sampling was adopted for collecting data. The study was approved by the institutional ethical committee. The assessment of patients were held directly in the Outpatient Department. The relevant information was entered into the predesigned proforma to estimate the severity of pain according to visual analog scale in adhesive capsulitis patients with DM. The collected data were entered into the computer and analyzed by using SPSS (version 20.1)

Results

Mean age of patients with adhesive capsulitis was 54.85±9.35 years. In 200 patient's majority 35% was between 51-55 years, 31% was between 56-60years, 22% was between 46-50 years, 12% was between 40-45 years. Among 200 patients with 61% was female and 39% was male. (Table-I)

Table-I: Demographic characteristics of the study population (n=200)

Parameter	Number	Percentage
Age of the patients		
40-45 years	24	12
46-50 years	44	22
51-55 years	70	35
56-60 years	62	31
Total	200	100
Sex		
Male	78	39
Female	122	61
Total	**200**	**100**

A total of 200 patients with diabetes were included in the final analysis. Among the DM patients 54(27%) had adhesive capsulitis, and 146(73%) did not have adhesive capsulitis.

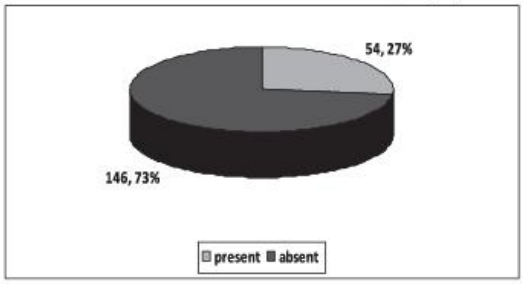

Figure-I: Distribution of patients according to frequency of Adhesive Capsulitis (n=200)

Female patients (65%) suffered from more adhesive capsulitis than male patients (35%). (Figure-II)

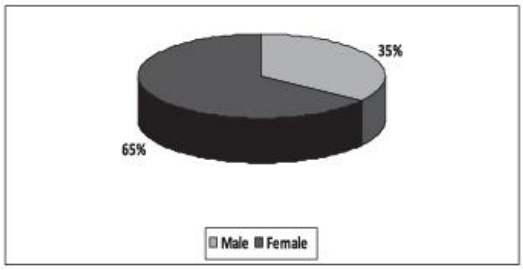

Figure-II: Pie chart showing presence of adhesive capsulitis among male and female (n=54).

Among the patients with adhesive capsulitis, most of the patients 22(41%) had VAS score 4-6 (moderate pain), 14 patients (26%) had VAS score 1-3(mild pain), 18 patients (33%) had VAS score 7-10 (severe pain). (Table-II)

Table-II: Severity of pain according to Visual Analog Scale (n=54)

Visual analogue score	Number of Patients	Percentage
0 (No pain)	0	0
1-3 (Mild pain)	14	26
4-6 (moderate pain)	22	41
7-10 (severe pain)	18	33

Discussion

Adhesive capsulitis is a distinctive clinical entity, usually occurring in the fifth and sixth decades. It may be associated with trauma or with various illnesses, but most cases are idiopathic. The evidence for disease

relationships is uncovering, with the possible exception of diabetes mellitus. A total number of 200 patients with diabetes were include in the final analysis. Among the patients 54(27%) had adhesive capsulitis, and 146(73%) did not have adhesive capsulitis. So, prevalence of Adhesive Capsulitis was 27%. A study was conducted by Khan et al. in a tertiary care hospital of Bangladesh upon 300 diabetic and 300 non-diabetic individuals. There, frequency of Adhesive Capsulitis in diabetic group was 20% and in non-diabetic group it was 5.66%.[6] According to that study our frequency result is higher. Probably because, a lot of diabetic patients with Adhesive Capsulitis come from BIRDEM General Hospital, which is a diabetic hospital and very near to BSMMU. Mean age of patients with adhesive capsulitis was 54.85±9.35 years. Among 200 patients, majority 35% was between 50-55 years, 31% was 56-60 years, 22% was 46-50 years, 12% was 40-45 years. In a case report in Bangladesh by Uddin et al. Reported that mean age of the patients was 53 years which is similar to our study.[7] Other observer found maximum patients 39% were between the age group of 51-60 which is also similar to our study.[8] Among 200 patients with 61% was female and 39% was male. In a study by Ahmed et al. reported among 325 patients 52.3% were male and 47.7 % were female which is not similar to us.[9] In another study by Khan et al. 31.67% patients were male and 68.33% were female which is similar to our study.[10] Among the patients with adhesive capsulitis most of the patient 16(29.62%) had VAS score 5-6, 14(25.92%) had VAS score 7-8, 12(22.22%) had VAS score 3-4, 8(14.81%) had VAS score 1-2, and 4(7.4%) have VAS score 9-10. In a study among 50 patients 32% had severe pain, 52% had moderate pain, and 16% had mild pain.[11] Which is also similar to this study. Adhesive capsulitis is a chronic disabling condition associated with pain, which require long- term management in the form of physiotherapy and repeated injections. Unfortunately, the treatment is more prolonged in DM patients, and surgery may be required if the condition is not treated early.[12]

Conclusion

Overall frequency of adhesive capsulitis of the shoulder among diabetic individuals attending in physical medicine and rehabilitation department of a tertiary care hospital was 27%. The disease affects predominantly females in sixth decade of age. Most of the adhesive capsulitis patients suffering from moderate type of pain which visual analogue score is 4-6.

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Original Article

Level of Disabilities among Migraine Patients at Neurology Outpatient Department in a tertiary hospital in Dhaka South City

Sharmin Jahan[1], Md. Nurul Amin Khan[2], Md. Ziaur Rahman Mamun[3], Kartick Chanda Shaha[4], Fahmida Hossain[5]

[1]Associate Professor (c.c)' Department of Community Medicine, Dhaka National Medical College, [2]Associate Professor, Department of Neurology, Dhaka National Medical College, [3]Assistant Professor (c.c), Department of Community Medicine, Dhaka National Medical College, [4]Assistant Professor (c.c), Department of Pharmacology, Dhaka National Medical College, [5]Lecturer, Department of Community Medicine, Dhaka National Medical College.

Abstract:

Background: Migraine is the most common cause of headaches that are responsible for different kinds of disabilities. There will be loss of work due to disabilities. This was an effort to obtain such information regarding the level of disabilities due to migraine.

Materials and Methods: The current study was cross-sectional type of descriptive observational study conducted from 1st June, 2017 to 30th may 2018. The study included the patients attending at Neurology Outpatient Department of Dhaka National Medical Institute Hospital. Data were collected by face-to-face interview. Collected data were computed and analyzed.

Results: Mean age of respondents 29.9 years with SD 14.28 ranging from 9.16 to 62.58 years. Among them about two-thirds (64%) of the respondents were female. More than one-third of the respondents (42%) were students. More than two-third of the respondents (68%) had interruption during sleep. More than two-third of the respondents (68%) felt pain for 2-3 hours. More than one-third of the respondents (34%) were overweight or obese. More than half (52%) of the respondents had severe disability.

Conclusion: Most of respondents were female and were students. They had impairment in their function and found severe disabilities. So, there was no scope to treat migraine as a simple way.

Key words: migraine, severe disabilities, female patients.

Introduction

There is nobody who does not suffer from headache. One of the most important causes of headache is migraine. Migraine is the first commonest disease among all the neurological diseases and is the sixth burdensome disease in the world.[1] Migraine was in 19th position in Global Burden of Disease 2000; and became seventh in 2010.[2] It is the 12th leading cause of disability among female.[3] It significantly reduces the quality of life of migraine sufferers. So, the productivity of a person decreases day by day. So, it is very important to measure the level of disability of a migraine patient and it will be helpful for treatment plan of a migraine patient. The current study was done for assessing the level of disability of migraine sufferers attending outpatient department in Dhaka National Medical Institute Hospital.

Methodology

This was a descriptive cross-sectional study done within one year from 1st June, 2017 30th may 2018. The study included the diagnosed patients of migraine came to the Neurology Outpatient Department in Dhaka National Medical Institute Hospital. The respondents were selected by convenient type of non-probability sampling. The pretested semi structure interviewer administered questionnaire was used comprised of (Migraine Disability Assessment) MIDAS scale developed by Professor Lipton RB. The questionnaire included questions based on the performance in defined roles and categorizes severity into four grades such as Grade I or little or no disability, Grade II or mild disability, Grade III or moderate disability and Grade IV or severe disability.[3,5] Descriptive statistics and chi-squire test were done.

Results

The average age of the four hundred respondents was about 30±14.2 years; ranging from 9.1 to 62.5. More than half of the respondents (64%) were female. The average age of the male and female were 28.4 and 30.9 years respectively.

Table-I: Mean age of the respondents by sex

Gender	Mean age (years)	N	SD
Male	28.4	144	15.0
Female	30.9	256	13.7

Half of the respondents (50%) had severe disability due to migraine. Chi-square (χ 2) test showed significant difference ($p < 0.01$) between male and female.

Sex of respondents	Level of disability; [N (%)]				p-value
	Little or no disability	Mild disability	Moderate disability	Severe disability	
Male	8 (5.6)	0 (0)	56 (38.9)	80 (55.6)	< 0.01
Female	8 (3.1)	16 (6.3)	104 (40.6)	128 (50)	

Occupation

More than one-third of the respondents (42%) were students and about one-quarter (24%) respondents were service holders.

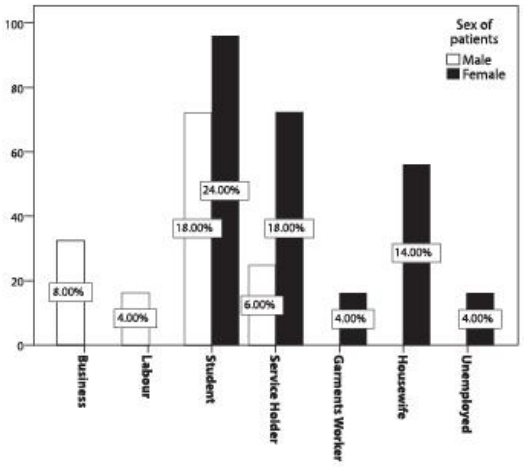

Figure-I: Main occupation of the respondents

Sleeping patterns

More than two-third of the respondents (68%) had interruption during sleep. More than half of respondents (62.5%), having continous sleep, sleept for 6 hours at night.

Table-III: Sleeping patterns of the repondents

Sleeping patterns	Duration of patient's sleep at night (hours); [N (%)]				
	4	5	6	7	8
Continous	0	0	80(62.5)	40 (31.3)	8 (6.3)
Interrupted	24 (8.8)	8 (2.9)	64 (23.5)	64 (23.5)	112 (41.2)

Duration of feeling pain

More than two-third of the respondents (68%) felt pain 2 to 3 hours.

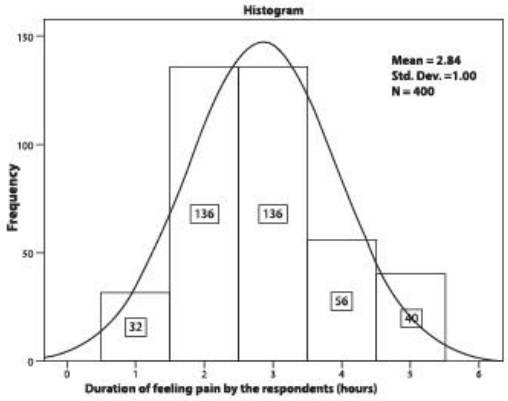

Figure-II: Duration of feeling pain

Frequency of migraine attack

Two-third of the respondents (66%) had migraine attack once per week.

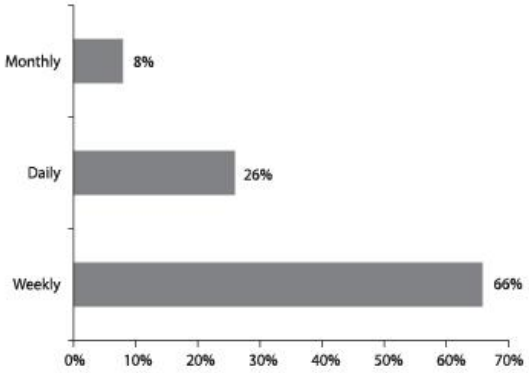

Figure-III: Frequency of migraine attack

Interpretation of MIDAS scale

More than half (52%) of the respondents were severely disable (MIDAS Grade IV), next to it (40%) were moderately disable (MIDAS Grade).

Table-IV: Interpretation of MIDAS scale

MIDAS Grade	MIDAS Definition	MIDAS Score	Frequency (%)
I	Little or No Disability	0-5	16(4.0)
II	Mild Disability	6-10	16(4.0)
III	Moderate Disability	11-20	160(40.0)
IV	Severe Disability	21+	208(52.0)

Discussion

More than half of the respondents (64%) were female in our study. Chowdhury MI et.al. (2012) and Amin MN et.al. (2012) conducted two separate studies in Bangabandhu Sheikh Mujib Medical University (BSMMU); found female patients 72.7% and 71.3% respectively.[6,7] Migraine prevalence was three times more in female.[8] A study done in Greece found the average age was 40 years, ranging from 20 to 64 years.[9] Chowdhury MI et.al. (2012) and Amin MN et.al. (2012) found the average age of 25.5 and 25.6 years; from 12 to 50 years and 20 to 30, respectively.[6,7] The current study revealed similar finding; i.e., average age of the respondents was 30 years, ranging from 9 to 62.5 years. Kelman L (2006) found than migraine pain triggered between 30 to 49 years of age.[10] More than one-third of the respondents (42%) were students in this study. Housewives and students constitute 80% in the study done by Amin MN et.al. (2012). 7 Oikonomidi (2018) found that more than three-quarters were students (76.7%). 9 The study done in Peshawar found that 40.2% of headaches among the medical students having headache were due to migraine. Researches showed that stress was one of the main causing agents of migraine.[11] Kelman L and Rains JC also mentioned as short sleepers who slept for 6 hours. They found that more than one-third (38%) were short sleepers.[12] The finding was similar to the findings of this present study, 36% were short sleepers. More than two-third of the respondents (68%) did not have continous sleep. Sleeping disturbance was common in migraine patients affecting 30% to 50% of cases.[13] The present study showed that more than half had severe disability (52% for grade IV). Similar finding was revealed in a study, 58.3% had severe disability (grade IV).[9] Similar picture was depicted in a study where more than two-third of the respondents (73%) had severe migraine disability.[3]

Conclusion

The study included a greater number of patients with severe disability. They had impairment in their function and found severe disabilities. So, there was no scope to treat migraine as a simple way.

Acknowledgement

Thanks to Professor Lipton RB as he made the MIDAS open access.

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Original Article

Determining Of Susceptibility & Resistant Pattern Of Bacteria Isolated From Pus Of Various Clinical Specimens

Begum Dilruba Kazi[1], Khadeza Khatun[2], Md. Maruf-Ur-Rahman[3], Abdul Wadud Ahmed[4]

[1]Professor (cc) & Head, Department of Microbiology, Dhaka National Medical College, [2]Associate Professor, Department of of Microbiology, National Centre for Control of Rheumatic Fever & Heart Disease, [3]Associate Professor (cc), Department of Biochemistry, Dhaka National Medical College, [4]Lecturer, Department of Microbiology, Dhaka National Medical College.

Abstract:

Background: Antibiotic resistance among pyogenic bacteria has been gradually increasing.Using antibiotics without proper determination of susceptibility and resistant pattern may lead to antibiotic abuse and ultimately antibiotic resistance. It is important to have knowledge about susceptibility and resistant pattern of organisms isolated from pus to choose the correct treatment regimen.

Objective: To determine the antibiotic susceptibility & resistant pattern of pyogenic bacteria isolated from pyogenic infection.

Methods: A cross sectional study was carried out at the Department of Microbiology, Dhaka National Medical College & Hospital from January 2021 to July 2021. A total 200 samples were taken from various clinical specimen containing pus. Samples from cases of Urethritis, Cervicitis, Meningitis, UTI or other Sexually transmitted infection were excluded from this study. Purulent conjunctival swab, ear swab, pus from wound,(surgical and accidental) abscess, were firstly tested by gram staining. Then cultured on Mac Conkey agar media & Blood agar media as well as Chocolate agar media if necessary. Then media were incubated at 37°c for 24-48 hours. Colonies grown on to media were further tested for coagulase test ,biochemical reaction,(oxidase test, and inoculated into soft agar media as TSI,) At last susceptibility and resistant pattern were tested on to Muller-Hinton agar media.

Results: A total 200 samples were taken from various clinical specimen containing pus. Staphylococcus aureus is the predominant among gram positive organisms. Among gram negative bacteria, Klebsiella pneumonia was the predominant organism. Staphylococcus aureus exhibit sensitivity to Vancomycin, Linezolid, Imipenem, Amikacin, Fusidic acid & Amoxicillin -Clavulinic acid combination. Staphylococcus aureus showed highest sensitivity to Vancomycin & exhibit maximum resistant to Cefixime. Pseudomonas showed a very good sensitivity to Amikacin, Imipenem, Tazobactam & Gentamycin but resistant to Ceftazidime and Co-trimoxazole. Pseudomonas is highly sensitive to Amikacin & highly resistant to Ceftazidime. Antimicrobial susceptibility of E.coli showed a very good sensitivity to Imipenem, Amikacin, Amoxiclav, Ceftriaxone & Ciprofloxacin but resistant to Cefixime, Cephradine, Ceftazidime & Cefuroxime . E.coli exhibit maximum sensitivity to Imipenem followed by Amikacin & showed maximum resistant to Cefixime.

Conclusion: This study showed that most common Pyogenic bacteria isolated from various clinical specimen are Staphylococcus aureus, Klebsiella spp, Pseudomonas spp, E. coli & Streptococcus pyogenes. Different bacteria differ in response to different antibiotic therapy. Based on this study it may be concluded that testing of sensitivity and resistant before starting antibiotic treatment is very important to prevent emergence of drug resistance bacterial strain.

Key words: Pus, Pyogenic bacteria, Susceptibility, Resistant pattern.

Introduction

Pyogenic infection refers to bacterial infection that leads to the production of pus. Pyogenic infection is characterized by several local inflammation, usually with pus formation, generally caused by the pyogenic bacteria, which can produce the accumulation of dead leukocytes and infectious agent commonly known as pus.[1]

Body's defense mechanism recruits immune cells into the infection site to fight against bacteria. Accumulation of these cells produces pus, causing pyogenic infection which actually delays the wound healing and may cause complication like wound dehiscence or wound breakdown.[2]

Pus consists of a thin, protein-rich fluid historically known as liquor puris[3] and dead leukocytes from the body's immune response (mostly neutrophils).[4] During infection, macrophages release cytokines, which trigger neutrophils to seek the site of infection by chemotaxis. There, the neutrophils release granules, which destroy the bacteria. The bacteria resist the immune response by releasing toxins called leukocidins. As the neutrophils die off from toxins and old age, they are destroyed by macrophages, forming the viscous pus. Bacteria that cause pus are called pyogenic.[5]

Pyogenic bacteria like Staphylococcus aureus and Streptococcus pyogenes account for greater than 80% of Pyogenic infection of skin and soft tissue.[6] Other gram negative Pyogenic bacteria include E coli, Klebsiella, pseudomonas, proteus spp.[7] Antibiotics to treat these pyogenic bacterial infections are routinely prescribed. Ciprofloxacin, Ceftriaxone, cloxacillin, imipenem, amikacin, Amoxicillin-Clavulinic acid combination are commonly used antibiotics to treat themComplications arising from pyogenic infection of skin & soft tissue by Staphylococcus aureus and Pseudomonous are a major clinical problem owing to wide spread emergence of antibiotic resistance bacterial strain.[8]

Drug resistance of pyogenic bacteria has been found to increase along with the frequency. This resistance can increase complications and costs associated with procedure and treatment. Routine isolation, identification and susceptibility testing of bacteria present several difficulties leading to defects in the determination of local susceptibility patterns which will guide empirical treatment protocol. This study was carried out to determine the antibiotic susceptibility & resistant pattern of pyogenic bacteria isolated from pyogenic infection.

Materials & Methods

A cross sectional study was carried out at the Department of Microbiology, Dhaka National Medical College & Hospital from January 2021 to July 2021. A total 200 samples were taken from various clinical specimen containing pus. Samples from cases of Urethritis, Cervicitis, Meningitis, UTI or other Sexually transmitted infection were excluded from this study. Purulent conjunctival swab, ear swab, pus from wound,(surgical and accidental) abscess, were firstly tested by gram staining. Then cultured onto MacConkey agar media & Blood agar media as well as Chocolate agar media if necessary. Then media were inoculated at 37°c for 24-48 hours. Colonies grown on to media were further tested for coagulase test ,biochemical reaction,(oxidase test and incubated into soft agar media, TSI,). Antibiotic disks containing Amoxycillin, Amoxiclav, Cephradine, Ceftriaxone, Gentamycin, Doxycycline, Ciprofloxacin, Cefuroxime, Amikacin, Imipenem, Cloxacillin, Vancomycin, Cefixime, Linezolid, Fusidic acid, Azithromycin, Erythromycin, Colistin, Tazobactam were used. At last susceptibility and resistant pattern were tested by disk diffusion method on Muller-Hinton agar media and minimum inhibitory concentration, zone of inhibition were obtained.

Results

A total 200 samples were taken from various clinical specimen containing pus. Among these samples, positive culture was found in 163 (81.5%) samples & negative culture was found in 37 (18.5%) samples [Table I]. Among the positive culture, gram positive bacteria was found in 75 (46.01%) isolates & gram negative bacteria was found in 88 (53.88%) isolates [Table II]. In the gram positive growth, Staphylococcus aureus was found in 70 (93.33%) isolates & Streptococcus pyogenes was found in 5 (6.67%) isolates [Table III]. In the gram negative growth, Klebsiella was found in 45 (51.14%) isolates & Pseudomonas was found in 26 (29.54%) isolates & E. coli was found in 17 (19.32%) [Table IV]. Antimicrobial susceptibility pattern of Staphylococcus aureus was evaluated. Staphylococcus aureus exhibit sensitivity to Vancomycin, Linezolid, Imipenem, Amikacin, Fusidic acid & Amoxicillin-Clavulinic acid combination. Intermediate sensitive to Cloxacillin, Ceftriaxone & Azithromycin. Staphylococcus aureus exhibit resistant to Cephradine & Cefixime [Table V]. Antimicrobial susceptibility of Pseudomonas showed a very good sensitivity to Amikacin, Imipenem, Tazobactam & Gentamycin, intermediate resistant to Colistin & Ciprofloxacin but resistant to Ceftazidime and Co-trimoxazol [Table VI]. Antimicrobial susceptibility pattern of Klebsiella was evaluated. Klebsiella exhibit sensitivity to Amikacin, Colistin, Tazobactam & Amoxiclav, intermediate resistant to Ciprofloxacin but

resistant to Cefixime, Cephradine, Ceftazidime & Cefuroxime [Table-VII]. Antimicrobial susceptibility of E.coli showed a very good sensitivity to, Imipenem, Amikacin, Amoxiclav, Ceftriaxone & Ciprofloxacin but resistant to Cefixime, Cephradine, Ceftazidime & Cefuroxime [Table-VIII].

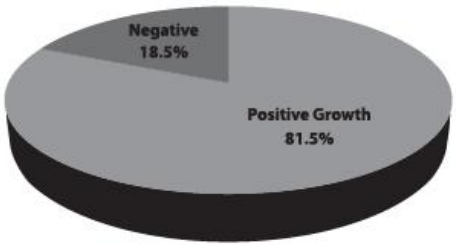

Fig-I: Percentage of Positive culture out of 200 samples.

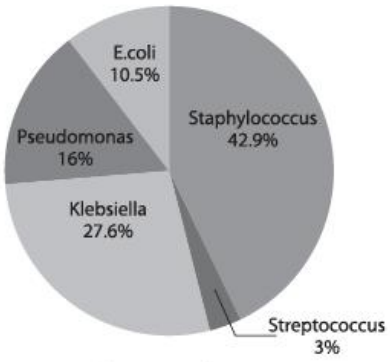

Fig-II: Types of bacteria of 163 Positive growth.

Table-I: Percentage of Positive and Negative culture out of 200 samples.

Description	Number	Percentage (%)
Total suspected samples	200	100
Positive culture	163	81.5
Negative culture	37	18.5

Table-II: Percentage of gram Positive and gram Negative bacteria out of 163 positive culture samples.

Description	Number of isolates	Percentage (%)
Total growth	163	100
Gram positive bacteria	75	46.01
Gram negative bacteria	88	53.99

Table-III: Percentage of different Gram-positive isolates out of 75 positive culture growth

Name of bacteria	Number of isolates	Percentage (%)
Total Gram-positive growth	75	100
Staphylococcus aureus	70	93.33
Streptococcus pyogenes	5	6.67

Table-IV: Percentage of different Gram-negative isolates out of 88 negative culture growth

Name of bacteria	Number of isolates	Percentage (%)
Total Gram-negative growth	88	100
Klebsiella	45	51.14
Pseudomonas	26	29.54
E. coli	17	19.32

Table-V: Antimicrobial susceptibility pattern of Staphylococcus aureus

Antimicrobial	Sensitive	Intermediate	Resistant
Vancomycin	97-99%		
Linezolid	90-92%		
Imipenem	87-90%		
Amikacin	88-90%		
Fusidic acid	84-88%		
Amoxiclav	80-81%		
Cloxacillin		50-60%	
Ceftriaxone		53-57%	
Azithromycin		40-45%	
Cephradine			83-88%
Cefixime			85-90%

Table-VI: Antimicrobial susceptibility pattern of Pseudomonas spp isolated from pus samples

Antimicrobial	Sensitive	Intermediate	Resistant
Amikacin	94-95%		
Imipenem	88-90%		
Tazobactam	78-80%		
Gentamycin	75-77%		
Colistin		68-72%	
Ciprofloxacin		63-70%	
Ceftazidime			91-93%
Cotrimoxazol			84-85%

Table-VII: Antimicrobial susceptibility pattern of Klebsiella spp

Antimicrobial	Sensitive	Intermediate	Resistant
Amikacin	93-95%		
Colistin	85-90%		
Tazobactam	86-88%		
Amoxiclav	78-81%		
Ciprofloxacin		52-55%	
Cefixime			76-82%
Cephradine			85-90%
Ceftazidime			88-93%
Cefuroxime			91-93%

Table-VIII: Antimicrobial susceptibility pattern of E. coli

Antimicrobial	Sensitive	Intermediate	Resistant
Imipenem	88-90%		
Amikacin	80-81%		
Amoxiclav	82-85%		
Ceftriaxone	77-82%		
Ciprofloxacin	73-76%		
Cefixime			76-82%
Cephradine			61-68%
Ceftazidime			66-70%
Cefuroxime			68-74%

Discussion

Pyogenic infections are still frequently seen in the developing countries and the treatment is a considerable challenge despite advances in microbiological techniques, antibiotics and surgical treatment. To ensure an adequate and efficient therapy, it is necessary to identify and treat the focus of inflammation. Management of several pyogenic infections consists of aspiration or surgical drainage followed by appropriate antibiotics. Wound infections have been a problem in the field of surgery for a long time. Advances in control of infection have not completely eradicated this problem because of the development of drug resistance. It is important to have clear conception about susceptibility and resistant pattern of organisms isolated from pus to choose the correct treatment regimen. In our study, susceptibility & resistant pattern of bacteria isolated from pus of various clinical specimens were evaluated.

A cross sectional study was carried out at the Department of Microbiology, Dhaka National Medical College & Hospital from January 2021 to July 2021. A total 200 samples were taken from various clinical specimen containing pus.

In present study, Staphylococcus aureus is the predominant organism among Gram positive organisms which is comparable with many studies.[9,10] Among gram negative bacteria, Klebsiella pneumonia is predominant organism isolated in our study with similar findings shown in studies by Sharma V et al10 and Panta K et al.[11] But in the study conducted by Kumar AR et al9 and Verma P et al,[12] it was second most common isolate.

Antimicrobial susceptibility pattern of Staphylococcus aureus was evaluated in this study. Staphylococcus aureus exhibit sensitivity to Vancomycin, Linezolid, Imipenem, Amikacin, Fusidic acid & Amoxicillin -Clavulinic acid combination. Intermediate sensitive to Cloxacillin, Ceftriaxone & Azithromycin. Highest sensitivity to Vancomycin was observed in this study & this result was consistent with study conducted by Taiwo et al.[13] Staphylococcus aureus exhibit maximum resistant to Cefixime followed by Cephradine. Resistance for third generation cephalosporin like Ceftriaxone was found in study conducted by Duggal S et al.[14] A study in Iran by sarraafzadeh F et al[15] reported 9.2% resistance for Vancomycin and some study showed 100% sensitive.[16]

Antimicrobial susceptibility of Pseudomonas showed a very good sensitivity to Amikacin, Imipenem, Tazobactam & Gentamycin but resistant to Ceftazidime and Cotrim. Pseudomonas was highly sensitive to Amikacin & highly resistant to Ceftazidime. Antimicrobial susceptibility of E.coli showed a very good sensitivity to Imipenem, Amikacin, Amoxiclav, Ceftriaxone & Ciprofloxacin but resistant to Cefixime, Cephradine, Ceftazidime & Cefuroxime . E.coli exhibit maximum sensitivity to Imipenem followed by Amikacin & showed maximum resistant to Cefixime followed by Cephradine. A study by Chaudary R et al[17] reported that Amikacin (93%) to be the drug of choice for gram negative bacterial isolates which was comparable with our study results. Similarly, Timilsina et al[18] showed the sensitivity of Amikacin to be 93.62% followed by Gentamycin 89% for gram negative

isolates. For E. coli, Timilsina et al[18] found out that the most effective antibiotic was Amikacin (100%). Shrestha et al[19] also showed Amikacin (94.38%) to be the most sensitive antibiotic for E. coli. Abdullah et al[20] showed low sensitivity of Doxycycline (11.5%) and high sensitivity to Amikacin (89.4%) in Klebsiella isolates. Antibiotic sensitivity of these microorganism showed that all of them are commonly sensitive to Amikacin.

Conclusion

In our study, the most common pyogenic organisms isolated from various clinical specimen are Staphylococcus aureus, Klebsiella spp, Pseudomonas spp, E. coli & Streptococcus pyogenes. Staphylococcus aureus is the predominant organism among Gram positive bacteria & Klebsiella spp is the predominant organism among Gram negative bacteria. This study showed that antibiotic sensitivity & resistant pattern varies from bacteria to bacteria. Amikacin is the drug of choice of both gram positive & gram negative bacteria. Based on this study, it may be concluded that testing of sensitivity & resistant pattern before starting antibiotic treatment is very important to prevent emergence of drug resistance bacterial strain. Though antimicrobial susceptibility of microorganisms varies from time to time and from place to place, so regular monitoring of bacterial susceptibility to antibiotics is essential. Antibiograms should be prepared regularly and made readily available to the clinicians to guide them in therapy. This study might be useful to revise current empirical therapy policies for treatment of bacterial infection & antibiotic therapy should be reconsidered after testing their anti-microbial susceptibility pattern.

Limitation of study: History taking of antibiotics were not possible in some case.

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Original Article

Study on Maternal & Fetal Outcome of Jaundice with Pregnancy

Refath Ara Mahfuz[1], Manifa Naz Fatema[2], Arzumanth Ara Begum[3], Emdadul Hoque[4]

[1]Associate Professor (cc), Department of Obstetrics & Gynaecology, Dhaka National Medical College, [2]Junior Cunsultant, Department of Obstetrics & Gynaecology, Dhaka National Medical College, [3]Professor & Head, Department of Obstetrics & Gynaecology, Dhaka National Medical College, [4]Associate Professor (cc), Department of Obstetrics & Gynaecology, Ad-din Sakina Medical College, Jessore.

Abstract

Background: Pregnancy with jaundice is regarded as high risk pregnancy so it is considered very important sign during antenatal check up. It complicates pregnancies and is one of the important causes of maternal and neonatal morbidity and mortality worldwide. Viral hepatitis is the most frequent cause of jaundice associated with pregnant woman.

Objective: To assess the maternal & fetal outcome of jaundice in pregnant women

Methods: This study was a cross sectional study carried out Department of Obstetrics and Gynaecology, Dhaka National Medical College Hospital, Dhaka From April 2016 to September 2017. All diagnosed cases of pregnancy with jaundice full filing the inclusion and exclusion criteria in the department of Obstetrics and Gynecology, Dhaka National Medical College Hospital, Dhaka. Total 50 sample were taken in this study.

Results: Fifty pregnant women the mean age was 24.40±4.32 years. The causes of jaundice during pregnancy were viral hepatitis (82%), obstetrics cholestasis (10%) and HELLP syndrome (8%). The total infective pathology due to hepatitis E (HEV) being the major cause of infection i.e. 42%, followed by Hepatitis Hepatitis B in 32%, Hepatitis C (HCV) in 2%. However, 8% of the mothers were infected with mixed viral hepatitis. Among them 12% underwent caesarean section. Among the neonates of the 47 mothers who recovered, 16% had a neonatal death and 34% had low birth weight.

Conclusion: This study shows hepatitis B (HBV) infection during third trimester of pregnancy associated with more serious complication than other types of viral hepatitis. It is recommended that women in the reproductive age group (before the first pregnancy) should receive full course of hepatitis B vaccine. Public awareness, complete immunization against viral hepatitis, better sanitation facilities, safe drinking water, increased availability of antenatal care for early detection and well equipped hospitals for intensive care.

Introduction

Jaundice in pregnancy is an important medical disorder seen more often in the developing countries. Clinical jaundice is established when the serum bilirubin level exceeds 2mg% (normal 0.2-0.8 mg%).[1] Approximately 3-5% of pregnant women have jaundice in pregnancy, whilst relatively rare, has potentially serious consequences for maternal and fetal health.[1,2]

There are several causes of jaundice in pregnancy with infections due to hepatitis viruses A, B, C, D and E. Incidence of hepatitis varies greatly around the world: in developed countries, the incidence is around 0.1%, whereas in developing countries it can range from 3-20% or higher. The course of most viral hepatitis infections (A, B, C, D) is unaltered by pregnancy, although in developing countries there is a higher incidence of infant mortality with fulminant hepatitis. The exception is hepatitis E where pregnant women who contact the disease exhibit fatality rates of 10-20%.[3]

Jaundice in pregnancy can be caused by viral hepatitis, intrahepatic cholestasis of pregnancy, choledocholithiases, HELLP syndrome (hemolysis, elevated liver enzymes, and a low platelet count), severe preeclampsia, and acute fatty liver of pregnancy. Acute fatty liver of pregnancy occurs in approximately 1 in 13,000 pregnancies. More than 90% of patients with acute fatty liver of pregnancy have jaundice and disseminated intravascular coagulopathy.[4]

The various maternal complications associated with viral hepatitis are preterm labour, obstetric haemorrhage, fulminant hepatitis, hepatic encephalopathy, renal failure, DIC and death. The

various foetal complications are intrauterine death, prematurity and risk of vertically transmitting the hepatitis infection.[5]

Medical termination of pregnancy does not always alter the prognosis of the patient. The foetal outcome includes increased incidence of abortion, premature labour and intrauterine death leading to increased foetal wastage. Perinatal mortality (including stillborns and death of the baby within seven days following delivery) of pregnancies with jaundice in developing countries range form 20% to as high as 70%.[6]

Materials & Methods

This study was a cross sectional study carried out Department of Obstetrics and Gynaecology, Dhaka National Medical College Hospital, Dhaka From April 2016 to September 2017. All diagnosed cases of pregnancy with jaundice full filing the inclusion and exclusion criteria in the department of Obstetrics and Gynecology, Dhaka National Medical College Hospital, Dhaka. Total 50 sample were taken in this study. Data was collected using a structured questionnaire (research instrument) containing all the variables of interest. Data were processed and analyzed with the help of computer program SPSS (Statistical package for Social Science) with version 20.

Results

Table-I : Age distribution of the patients (n=50)

Characteristics	No. of patients	Percentage (%)
Age in years		
≤20	9	18
21-25	25	50
26-30	11	22
31-35	5	10
Mean±SD	24.40±4.32	

Table-II: Distribution of jaundice (n=50)

Jaundice	No. of patients	Percentage (%)
Mild	4	8
Moderate	33	66
Severe	13	26
Total	**50**	**100.0**

Table-III: Distribution of patients according to causes of jaundice during pregnancy (n=50)

Causes	No. of patients	Percentage (%)
Viral hepatitis	41	82
HAV	0	00
HBV	16	32
HEV	21	42
HCV	1	2
Mixed viral hepatitis	3	6
Obstetric cholestasis	5	10
HELLP syndrome	4	8
Total	**50**	**100**

Table-IV : Distribution of mode of delivery (n=50)

Mode of delivery	No. of patients	Percentage (%)
Normal	44	88
LUCS	6	12
Total	**50**	**100.0**

Table-V: Distribution of maternal outcome

Outcome	No. of patients	Percentage (%)
Improved well	48	96
Maternal death	2	4
Total	**50**	**100.0**

Table-VI: Distribution of maternal complication and viral hepatitis in study population (n=18)

Maternal complication	HAV	HBV	HEV	HCV	Mixed
	No(%)	No(%)	No(%)	No(%)	No(%)
PPH (n=14)	3(21.42%)	7(50.0)	1(7.14)	1(7.14)	2(14.28)
Fulminant hepatic failure (n=2)	0(00)	0(00)	0(00)	0(00)	2(100)
Heart failure (n=2)	0(00)	2(100)	0(00)	0(00)	0(00)

Table-VII: Birth weight

Fetal outcome	No. of patients	Percentage (%)
<2.5 kg	17	34
>2.5 kg	33	66
Total	**50**	**100.0**

Table-VIII: Distribution of fetal outcome (n=50)

Fetal outcome	No. of patients	Percentage (%)
Survives well	42	84
Perinatal death	8	16
Total	**50**	**100.0**

Discussion

Hepatitis in pregnant women may be consequent to infection with hepatitis viruses A, B, C, D and E. Hepatitis E is the most common infecting accounting for 50- 70 % of all patients with sporadic viral hepatitis. Studies from the developed countries conclude that pregnant state perse has no adverse effect on the course of hepatitis, provided nutrition is adequate. However increase in fetomaternal mortality has been reported mainly from the developing countries.[7,8]

The age of women included in the study was in the range of 19-35 years. The mean age of the patients in the study group was 24.40⊠4.32 years. Similar study was conducted in our hospital by Patra et al.[9] in the year 2003-2005 on 220 pregnant women presenting with jaundice caused by acute viral hepatitis had found mean age to be 24.3±3.3 yrs. The mean age of the patients in our study is comparable to another Indian study conducted by Kumar et al.[10] who studied prevalence of HEV and its complication in 62 pregnant women with acute viral hepatitis in their third trimester admitted in Delhi tertiary hospital in the year 2003 was seen to be 24.13±3.6 yrs. It is consistent with other international studies conducted by Miranda et al.[11] (23.8±6 yrs) who studied seroprevalence of HBV and HIV and associated risk behaviors among 1608 attending antenatal attendees of Vitoria, Brazil in the year 1999 and by Surya et al.[12] (27±5yrs) who screened 2,450 pregnant mothers.

This study shows 32% of cases with clinical jaundice were infected with Hepatitis B. Prevalence of HBV infection in pregnant women with acute viral hepatitis reported is consistent with other Indian studies. An earlier study conducted in our hospital by Nguyen et al.[13] in the year 2003-2005 on 220 pregnant women presenting with jaundice caused by acute viral hepatitis had found 33% prevalence of HBV.

Other hepatitis viral markers positive in pregnant women with clinical jaundice were anti HEV. The prevalence of HEV antibody was found to be 42% in Four studies from New Delhi[10,14] reported prevalence of HEV as 37%, 45.2%, 47.4% and 60%. Jaiswal et al.[14] in central India and Aziz et al.[15] in Pakistan reported that HEV is responsible for 58% and 62% of cases of acute viral hepatitis in pregnant women, respectively. Khuroo et al.[16] in Saudi Arabia reported 49.6% prevalence after evaluating 76 pregnant women with hepatitis.

This study HCV was found to be 2% in cases of pregnant women with clinical evidence of hepatitis in our study. This is in accordance with the earlier studies of Patra et al.9 (5%) in the same institution. However, in the past studies from India have not implicated HCV prevalence in pregnant women with acute viral hepatitis. Beniwal et al.[17] (n=97) and Singh et al.[18] (n=50) both in tertiary care Delhi hospital found zero prevalence, probably the number of cases studied was too low. Study outside India conducted by Khuroo et al.[16] from Saudi Arabia also reported low prevalence of HCV (1.7%).

Low prevalence in pregnant women has been observed studies outside India by Khuroo et al.[16] in Saudi Arabia (1.5%) and Aziz et al.[115] in Pakistan (4%). It was seen that six patients of the 100 pregnant women with clinical evidence of hepatitis were co infected with another hepatitis virus. Four out of 37 (10.8%) HBsAg positive mothers were co infected with Hepatitis D viruses and 2 out of 37 (5.4%) HBsAg positive mothers were co infected with HCV. Similar coinfection study on pregnant women in Delhi by Kumar et al.[10] showed HBV and HCV coinfection to be 4.8%. Studies outside India in Saudi Arabia and Africa[14] have reported HBV and HDV coinfection as 1.5% and as 15.6%.

Out of 50 mothers, 94% recovered completely. Among these 12% underwent caesarean section. The majority pregnant mothers had vaginal delivery. Postpartum haemorrahge is a common maternal complication of hepatitis in pregnancy and is observed in studies by Beniwal et al.[17] (14.9%) after studying 48 pregnant women with acute viral hepatitis. Mirghani et al.[19] (20.8%) in a case control study on 50 pregnant women with acute viral hepatitis at a Sudan hospital. It is the important complication observed in Indian studies also by Veronica et al.[20] (56%) conducted at Ludhiana tertiary hospital on 65 pregnant women with jaundice.

Foetal Outcome eight out of 50 pregnant women with clinical evidence of hepatitis in the study group were died. All of these mothers had Hepatitis E infection and underwent encephalopathy and died. The findings are consistent with studies by Mirghani et al.19 (6.3%), Medhat et al.[21] (8.3%), and Kumar et al.[22] (3.8%). Out of ninety-four mothers who recovered from viral hepatitis, 5 (5.3%) had lost their neonates. Medhat et al.[21]

observed 6.3% of neonatal deaths whereas Tripti et al.[23] observed it to be 11.8%. Low birth weight was found in 30.8% of neonates. Low birth weight in infants born to mothers with acute viral hepatitis has been reported by Kumar et al.[22] (7.6%) and Veronica et al.[20] (20%).

Conclusion

This study also shows hepatitis B infection was the commonest cause of maternal mortality in jaundice with pregnancy followed by, in postpartum hemorrhage (PPH) fulminnat hepatic failure with severe anemia. The study suggests that it is mostly restricted to last trimester and is associated with preterm labour and significant perinatal death. It also indicates that there is increased prevalence of Hepatitis B virus infection in pregnant women in Bangladesh. Thus to conclude, public awareness and complete immunization against viral hepatitis, better sanitation facilities, safe drinking water and increased availability of antenatal care for early detection and well equipped hospitals for intensive care will go long way in the reduction of viral hepatitis in pregnancy and also its associated maternal and perinatal mortality and morbidity.

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Review article

Micropenis

Shahin Ibn Rahman[1], Nausher Azimul Huq[2], Bimol Kumar Agarwala[3]

[1]Assistant Registrar, Department of Endocrinology, Dhaka National Medical Institute Hospital, [2]Associate Professor and Head, Department of Endocrinology, Dhaka National Medical College, [3]Associate Professor (C.C) of Endocrinology, Dhaka National Medical College.

Abstract

Micropenis is a medical diagnosis based on correct measurement of penile length. If stretched penile length is below the value corresponding to - 2.5 standard deviation of the mean in a patient with normal internal and external male genitalia, a diagnosis of micropenis is considered. Micropenis can be caused by a variety of factors including structural or hormonal defects of the hypothalamic-pituitary-gonadal axis. It can also be a component of a number of congenital syndromes. For the etiological evaluation, endocrinologic tests are important. This article reviews the etiology, diagnosis, treatment and management of micropenis.

Key words: Micropenis, Etiology, Diagnosis, Treatment

Introduction

Micropenis is a medical diagnosis often incorrectly made. A misdiagnosis may cause parental anxiety and may lead to unnecessary examinations and tests. The correct diagnosis is made by measuring stretched penile length. The first description of standard penile length for age was used by Schonfeld and Beebe in their seminal work.[1] In time, the definition of micropenis was accepted as a penile length smaller than 2.5 standard deviations (SD) below the mean.[2] Micropenis may occur as an independent abnormality by itself or as a clinical finding of many syndromes.[3]

Embryology

During embryonic development, following the differentiation of bipotential gonadal ridge to testis, placental human chorionic gonadotropin (hCG)-driven testosterone synthesis begins in Leydig cells at 8-12 weeks, resulting in penile differentiation stimulated by dihydrotestosterone (DHT), a product of transformation. Fetal androgen levels are high between the 8th and 24th weeks of gestation, with peak levels often observed between the 14th and 16th weeks. Consequently, there is a marked increase in penile length during the second and third trimesters, with an increase of approximately 20 mm from weeks 16 to 38.[4,5] It can thus be deduced that a true micropenis is caused by a hormonal abnormality that occurs after the 12th week of gestation.[6] Hormonal activity of the hypothalamic-pituitary axis and that of the testes increases within the first 6 months of postnatal life. The reason for the activation of the axis is, due to pituitary gonadotropin secretion, cessation of the negative feedback effects of both the placental sex steroids and peptides. An increase in both testis volume and penile length is observed physiologically during this active phase.[7] During this period, follicle stimulating hormone (FSH) and luteinizing hormone (LH) levels rise increasing the circulating testosterone, inhibin B, and anti-Mullerian hormone (AMH) levels, sometimes even to higher levels than in adult males.[8,9] Testosterone levels increase in parallel to the activation peak between the 1st and 3rd months and decrease to prepubertal levels from the 4th-6th months onwards.[10]

Table-I: Normal SPL

Age	Mean ± SD	Mean - 2.5SD
Newborn, 30-week gestation	2.5 ±0.4	1.5
Newborn, 34-week gestation	3.0±0.4	2.0
0-5 months	3.9 ±0.8	19
6-12 months	4.3 ± 0.8	2.3
1-2 years	4.7 ± 0.8	2.6
2-3 years	5.1 ± 0.9	2.9
3-4 years	5.5 ± 0.9	3.3
4-5 years	5.7 ± 0.9	3.5
5-6 years	6.0 ± 0.9	3.8
6-7 years	6.1 ± 0.9	3.9
7-8 years	6.2 ± 1.0	3.7
8-9 years	6.3 ± 1.0	3.8
9-10 years	6.3 ± 1.0	3.8
10-11 years	6.4 ± 1.1	3.7
Adult	13.3 ± 1.6	9.3

Etiology

True micropenis is a result of a hormonal abnormality occurring after 12 weeks of gestation. The causes of this condition can be divided into three broad groups: hypogonadotropic hypogonadism (pituitary/hypothalamic failure), hypergonadotropic hypogonadism (primary testicular failure), and idiopathic. These represent the most common etiologies of micropenis.[11,12,13]

Table- II: Highlights the different etiologies.

I. Deficient testosterone secretion

A. Hypogonadotropic hypogonadism

1. Isolated, including Kallmann's syndrome
2. Associated with other pituitary hormone deficiencies
3. Prader-Willi syndrome
4. Laurence-Moon syndrome
5. Bardet-Biedl syndrome
6. Rud's syndrome

B. Primary hypogonadism

1. Anorchia
2. Klinefelter's and poly-X syndromes
3. Gonadal dysgenesis (incomplete form)
4. Luteinizing hormone receptor defects (incomplete forms)
5. Genetic defects in testosterone steroidogenesis (incomplete forms)
6. Noonan's syndrome
7. Trisomy 21
8. Robinows syndrome
9. Bardet-Biedl syndrome
10. Laurence-Moon syndrome

II. Defects in testosterone action

A. Growth hormone/insulin-like growth factor-I deficiency
B. Androgen receptor defects (incomplete forms)
C. 5-a reductase deficiency (incomplete forms)
D. Fetal hydantoin syndrome

III. Developmental anomalies

A. Aphallia
B. Cloacalexstrophy

IV. Idiopathic

V. Associated with other congenital malformations

Diagnostic Evaluation

1. Measurement of penile length:

Correct measurement of penile length is important because the diagnosis of true micropenis depends on it. A correct and accurately measured penile length of -2.5 SD below the mean for age and presence of internal and external genital organs compatible with a 46, XY karyotype are sufficient findings to support a diagnosis of micropenis.[11]

a) Traditional methods utilize a ruler or caliper to measure penile length. Penile length should be measured when the penis is fully stretched, not flaccid; the glans penis should be held with the thumb and forefinger, and the measurement should be taken from the pubic ramus to the distal tip of the glans penis over the dorsal side. The suprapubic fat pad should be pressed inwards as much as possible, and if present, the foreskin must be retracted during the measurement (Figure-I).[11,14]

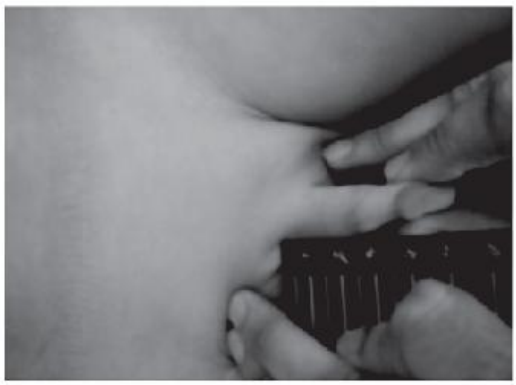

Figure-I: correct technique for SPL measurement.

b) A different approach involves the use of a 10 mL disposable syringe. The needle-side tip of the syringe is cut off, and the piston is inserted into the syringe on the cut side (Figure-II). The open side of the syringe is placed on the penis. The piston is pulled back while pressing the fat pads inwards, which causes the penis to be pulled inside the syringe as a result of suction. Once the penis is stretched inside the syringe, penile length is read from the scale added on the modified syringe.[15]

Figure-II: a modified syringe.

2. Laboratory tests:

First –line tests are serum gonadotrophins (FSH LH), testosterone, DHT,GH, PRL, ACTH, Cortisol, TSH, FT4.

Second-line testicular function test by hCG stimulation test. Inhibin B and AMH, also known as Mullerian-inhibiting hormone are produced by functional Sertoli cells, and determination of their blood levels can be used to detect the presence of functional testicular tissue. Low levels of AMH, accompanied by normal inhibin B levels, and a rare defect in the AMH gene, indicate persistent Mullerian duct syndrome.[9]

Imaging tests are pelvic ultrasound to visualize internal genital organs in suspicious cases and MRI is used to investigate structural midline defects, such as pituitary stalk dysplasia syndrome, central diabetes insipidus characterized by absence of the pituitary bright spot in the posterior neurohypophysis, and pituitary dysplasia.[9,16]

Genetic tests, some authors suggest karyotype assignment using chromosomal analysis or Y-fluorescence in order to determine the sex. Genetic testing may be necessary to eliminate other syndromes.[17]

Differential Diagnosis

1. Inconspicuous penis: Loose penile skin that does not stretch tightly around the body of the penis, penile skin being insufficient or imperfect, excessive fatty tissue, formation of scar tissue following a penile surgery, and presence of a web of skin underneath the penis.[18,19]
2. Buried penis: Children who present with a suspicion of micropenis are often prepubertal and obese, and the small size of their penis is caused by the pressure of the prepubic fat on the penis.[18]
3. Trapped penis: Is referred to as suprapubic fat pads surrounding the penis in the absence of additional skin for the shaft of penis.[19]
4. Webbed penis: Is characterized by a skin tissue connecting the penis to the front side of the scrotum.[17]
5. Penile agenesis, or absence of the penis and curvature of the head of the penis, or chordee, are rare conditions which should also be considered in the differential diagnosis.[17]

Treatment Approaches

Goal:

a) To provide a body image that will not cause embarrassment for the patient

b) To enable the patient to have normal sexual function, and

c) Also enable the patient to standing micturition.

Medical treatment:

a) Testosterone

Initially administered for a short period of time in order to evaluate the response of the penis. Administration can be by intramuscular injection or topical application. In order to observe initial progress, four doses of 25 mg of testosterone cypionate or enanthate in oil are administered intramuscularly once every 3 weeks for 3 months. It may cause temporary acceleration in growth rate and in advancement of bone age.[20]

b) Topical 5-α dihydrotestosterone (DHT) Gel

In prepubertal patients with androgen insensitivity, topical application of DHT gel to the periscrotal region 3 times daily for a total of 5 weeks has been shown to increase serum DHT levels.

c) LH-FSH Applications

Recombinant human FSH-LH treatment during the first few years of life promotes an increase in testicular growth and penile length in patients with hypogonadotropic hypogonadism, although this effect is not very significant.

Surgical treatment:

If the micropenis does not reach an adequate length despite medical interventions, surgical treatment options are considered. The first reconstructive surgery was reported by Hinman.21 in the early 1970s when he performed reconstruction on a patient with micropenis.

Conclusion

Micropenis is a medical diagnosis which is dependent on correct measurement. It may be an independent abnormality or a part of many syndromes. Micropenis can occur as a result of pituitary/hypothalamic insufficiency, primary testicular insufficiency, or can be idiopathic. Endocrinologic assessment helps in determining the etiology of micropenis. Early diagnosis is important for various treatment options.

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Case Report

X-linked ichthyosis associated with Hypohidrotic ectodermal dysplasia

Wazeda Begum[1], Lubna Khondker[2], Md.Maruf-Ur-Rahman[3], Tanuva Chandra[4]

[1]Registrar, Department of Dermatology & Venereology, Dhaka National Medical College, [2]Associate Professor, Department of Dermatology & Venereology, BSMMU, [3]Associate Professor, Department of Biochemistry, Dhaka National Medical College, [4]Medical Officer, Department of Dermatology & Venereology, Dhaka Medical College Hospital.

Abstract

X-linked ichthyosis is a genetic disorder characterized by a generalized scaling of the skin with large, polygonal, dark brown scales, more prominent on the extensor aspects of the limbs. Only males manifest the disease, while female carriers do not present it. Since 1978 it has been known that a deficit in steroid sulphatase enzyme (STS) is responsible for the abnormal cutaneous scaling, although the exact physiological mechanism remains uncertain. On the other hand, Hypohidrotic ectodermal dysplasia (HED) is a rare genetic disorder characterized by the faulty development of the ectodermal structure, resulting in most notably anhydrosis/hypohydrosis, hypotrichosis and hypodontia. The condition is usually an X-linked recessive disorder affecting predominantly males. But X-linked ichthyosis asociated with Hypohidrotic ectodermal dysplasia is a rare presentation. In this article we are reporting a rare case of X-linked ichthyosis associated with hypohidrotic ectodermal dysplasia.

Introduction

X-linked ichthyosis is a genetic disorder, X-linked, recessive pattern affecting approximately 1 in 6000 males,[1] with no significant racial or geographical differences. As seen in all diseases with a sex-linked recessive hereditary trait, X-linked ichthyosis is transmitted by women and affects males almost exclusively.[2]

Although Cockayne[3] was the first author to report the existence of clinical forms of ichthyosis affecting only males, X-linked ichthyosis was definitely separated from the rest of the ichthyoses as a distinct entity by Wells and Kerr[4] in 1965. That same year, France and Liggins[5] observed the absence of the enzyme STS in the placenta of some male foetuses and, in 1976, Jo¨bsis et a.[6] suggested that this deficiency could also be related to X-linked ichthyosis. In 1978, Koppe et al.[7] and Shapiro et al.[8] identified the STS enzyme deficiency in skin fibroblasts from patients with X-linked ichthyosis. These early reports were followed by others confirming that the deficit was widely distributed, involving other tissues such as the epidermis,[9] leucocytes[10] and stratum corneum.[11]

X-linked ichthyosis is characterized by the presence of dark brown, polygonal scales on different parts of the body surface. The lesions are usually distributed symmetrically and are generally more evident on the extensor aspects of the limbs, particularly on the lower extremities.[12] Scale size varies individually but in general the scales are larger on the extensor areas of the lower limbs than on the upper part of the trunk. The face is usually free of scales, except in the preauricular areas, which according to some authors is a pathognomonic feature.[13] Often, but not always, the flexures are affected (Fig. 1),[14] as are the neck and scalp, where pityriasiform desquamation is observed. The palms and soles are very rarely involved, although such involvement does not exclude a diagnosis of X-linked ichthyosis.[15] The hair and nails are normal.[16]

X-linked ichthyosis (XLI) may occur solely as a skin disorder or may be associated with other physical findings such as corneal opacities, cryptorchidism, chondrodysplasia punctata, and nephrotic syndrome.[17] Deletions encompassing STS have been reported to be associated with multiple behavioral, cognitive, and neurological phenotypes notably: mental retardation, developmental conditions including autism spectrum disorders (ASDs), attention deficit hyperactivity disorder (ADHD), and seizures.[18]

X-linked ichthyosis is rarely associated with Hypohidrotic ectodermal dysplasia (HED). Ectodermal dysplasias are a group of inherited disorders that share common developmental defects involving at least two of the major structures classically hold to derive from

the embryogenic ectoderms – hair, teeth, nails and sweat glands. HED is characterized by partial or complete absence of sweat glands, hypotrichosis, and hypodontia. The X-linked HED, otherwise called Christ–Siemens–Touraine Syndrome, was first described in 1848 by Thurnam. The incidence at birth is 1 in 100,000 males.[19]

HED can present with peeling skin similar to "post-mature" babies. Eccrine function (sweating), although present, is greatly deficient, leading to episodes of hyperthermia. More often, diagnosis is delayed until the teeth fail to erupt at the expected age (6- 9 months) or the teeth that erupt are peg-shaped, conical, or knife-edge in shape, which may affect the ability to eat and speech. Patients also have a peculiar facies, characterized by periorbital hyperpigmentation, depressed nasal bridge (saddle nose deformity), pointed chin, frontal bossing, everted lips, midface hypoplasia. They tend to have sparse scalp and body hair (hypotrichosis) that is often light-coloured and slow-growing; eyebrows and eyelashes are sparse or totally absent.[20] Abnormalities in function of the mucous membrane leads to frequent respiratory tract infections and changes in nasal secretions from concretions (solidified secretions in the nasal and aural passages) in early infancy to large mucous clots.[21] The epidermis is xerotic, with patches of hyperkeratosis and/or eczematous. Common otorhinolaryngological manifestations include chronic infections such as rhinitis, pharyngitis, otitis media, hearing loss, epistaxis, and dysphonia. As a consequence of gastroenteric glands hypoplasia, HED patients can also suffer from dysphagy and constipation.[22] Physical growth and psychomotor development are otherwise within normal limits. In HED males are affected but female carriers may manifest milder features: congenital tooth agenesis and misshapen teeth, sparse and thin hair and some problems with sweat glands function.[23] National Foundation for Ectodermal Dysplasias (NFED) has created a database for patients which allowed to determine the most frequent clinical characteristics in a large group of patients, based on this, the most reported feature in patients with HED is hypohidrosis, followed by hypotrichosis and hypodonthia equally represented among patients. Other complications described mainly in male patients are nasal congestion with bad odor interfering with feeding, eczema and recurrent sinusitis.[24]

Case Report

A 12 years old student hailing from Gazipur visited on 7 December 2018 at OPD of Dermatology and Venereology, BSMMU with the complaint of generalized dark, large scales for 12 years. This boy was brought to the hospital by his parents repeatedly due to decreased sweating, dry skin, recurrent episode of high-grade fever, and delayed eruption of abnormally shaped teeth.

Initially his parents noticed that erythema over abdomen which later developed dark, large scales on erythematous site. After some times scaling spreaded over different parts of the body but spare face, flexures, palm and sole. The elbow and knee flexures were relatively spared. Scales were dark, large and more prominent on extensor surface of the extremities and the trunk. Patient's conditions does not improve with age.

On integumentary system examination dark, Large, prominent Scales involving all over the body but more prominent in extensor surface of limbs and sparing the face, flexures, palm, sole. Mucous membrane and nail detect no abnormality. Other general & systemic examination reveal no abnormality.

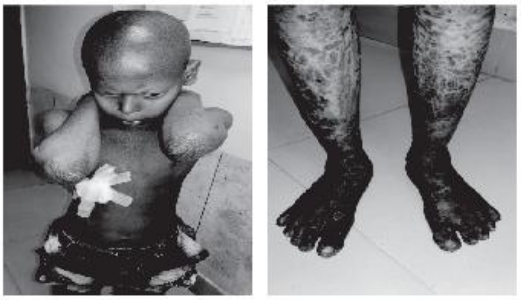

Fig-I: X linked ichthyosis showing prominent scales on extensor surface and abdomen

The boy was born via caesarian section. His mother noticed that absence of hair all over the body since birth. None of his family members was affected with this kind of illness. Based on the history, clinical features, and examination, the child was provisionally diagnosed as a case of X linked ichthyosis. This diagnosis has been confirmed by skin biopsy. Microscopic examination revealed mild hyperkeratosis with preserved granular layer in epidermis. The dermis showed mild perivascular infiltration of chronic inflammatory cells which was compatible with X linked ichthyosis.

His parents also gave the history of decreased sweating, dry skin, recurrent episode of high-grade fever, and delayed eruption of abnormally shaped teeth. The parents revealed that the child had intermittent episodes of fever in the past, associated with physical activity. Such episodes used to occur more frequently in hot climate, but no definite cause had been diagnosed for the same. There was a history of reduced sweating and heat intolerance. None of the family members was involved in a similar manner in previous generations. There was no history of consanguinous marriage of parents.

On examination, patient's vitals and systemic examination were normal. Intraoral examination revealed the child had mandibular and maxillary hypodontia with two peg-shaped incisors. There was loss of eyebrows and eyelashes. His skin was dry, warm, and sensitive.The nasal bridge was depressed and frontal bossing was present. The oral mucosa, palate, nails were normal. No other sibling had similar cutaneous features.

The systemic examination including otorhinolaryngological examination was normal. The physical development including external genitalia and mental development was normal. The routine biochemical tests were within normal limits. Patient's complete blood count, comprehensive metabolic panel, and urine analysis reports were normal. Based on the history, clinical features, and examination, the child was diagnosed as a case of hypohidrotic ED.

Discussion

X-linked ichthyosis (XLI) is a skin condition caused by the hereditary deficiency of the steroid sulfatase (STS) enzyme that affects 1 in 2000 to 1 in 6000 males.X-linked ichthyosis manifests with dry, scaly skin and is due to deletions[25] or mutations[26] in the STS gene.

Clinically, X-linked ichthyosis is characterized by a generalized scaling of the skin, with large, polygonal, dark brown scales, more prominent on the extensor aspects of the limbs. Only males manifest the disease, while female carriers do not present it. The lesions are usually distributed symmetrically and are generally more evident on the extensor aspects of the limbs, particularly on the lower extremities.[12]Scale size varies individually but in general the scales are larger on the extensor areas of the lower limbs than on the upper part of the trunk. The face is usually free of scales, except in the preauricular areas, which according to some authors is a pathognomonic feature. The palms and soles are very rarely involved, although such involvement does not exclude a diagnosis of X-linked ichthyosis.[15] The hair and nails are normal.[21]

Inherited ichthyoses are usually apparent during the first year of life, often at birth, and continue to affect a person throughout life.[27]

In our case, a 12 years old boy presented with generalized dark, large scales for 12 years. These dark, large, prominent scales involved all over the body but more prominent in extensor surface of limbs and sparing the face, flexures, palm, sole. Mucous membrane and Nail detect no abnormality. Hair is absent all over the body. Patient's conditions does not improve with age . All these features including skin manifestation consistened with typical features of X-linked ichthyosis.

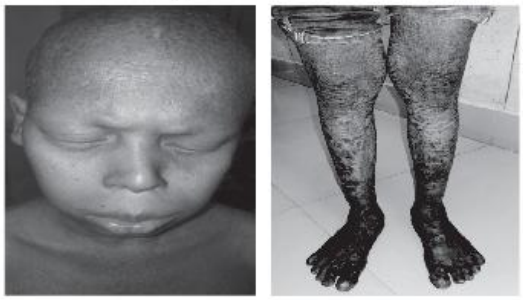

Fig-II: Hypohidrotic ectodermal dysplasia showing loss of eyebrows, eyelashes, scalp hair and dry skin involving lower limbs.

X-linked ichthyosis is usually associated with some extracutaneous manifestations like corneal opacity and cryptorchidism. Some authors have found corneal opacity to be more frequent during the second and third decades of life.[28] The incidence of cryptorchidism is higher in patients with X-linked ichthyosis than that expected in the general population,[29] Some neurological findings observed in patients with X-linked ichthyosis are epileptic seizures[14] and reactive psychological disorders.[30] But our case having no such type of extracutaneous manifestations or any neuological or psychological disorders.

Hypohidrotic ectodermal dysplasia (HED) is a rare genetic disorder characterized by the faulty development of the ectodermal structure, resulting in most notably anhydrosis/hypohydrosis, hypotrichosis and hypodontia. This condition is usually an X-linked recessive disorder affecting predominantly males.[31]

In our case, a 12 years old boy presented with decreased sweating, dry skin, recurrent episode of high-grade fever, and delayed eruption of abnormally shaped teeth.

Clinically, HED is characterized by sparse or absent eccrine glands as well as by hypotrichosis and oligodontia with peg-shaped teeth.The conical and pointed teeth are key features of the syndrome and may be the only obvious abnormality.[32] Same features were present in our case.

Because of their severely diminished ability to sweat, patients with HED have a propensity to develop hyperthermia with physical exertion or exposure to a warm environment, and affected infants often present with recurrent high fevers.[32]

In our case, the child had intermittent episodes of fever in the past, associated with physical activity. Such episodes used to occur more frequently in hot climate, but no definite cause had been diagnosed for the same. There was a history of reduced sweating and heat intolerance.

In HED, The scalp hair, eyebrows, and eyelashes are sparse, fine, and oftentimes lightly pigmented. Our patient had loss of eyebrows, eyelashes and scalp hair. In contrast to several other types of ectodermal dysplasia, nails were normal. HED patients have a characteristic facies with frontal bossing, a saddle nose, and full, everted lips.[33] Same findings were found in our case.

Conclusion

To the best of our knowledge, this is the first rare case report of X-linked ichthyosis associated with hypohidrotic ectodermal dysplasia in our country. When a clinician will face a case of X-linked ichthyosis, association of Hypohidrotic ectodermal dysplasia should not be overlooked. A multidisciplinary teams consisting of physicians from several clinical modalities is required to provide comprehensive medical care to children suffering from X-linked ichthyosis associated with hypohidrotic ectodermal dysplasia. As X-linked ichthyosis is caused by a gene mutation or deletion, there is no "cure." One of the aims of treatment is to reduce scaling by removing the excess, flaky scales, and keep the skin hydrated. This can be achieved using a variety of topical creams. The pediatrician should manage acute complications of ectodermal dysplasia such as hyperpyrexia and respiratory infections symptomatically. The pediatric dentist should use dentures, prosthetics etc. Consultation with a child psychologist, dermatologist, otolaryngologist, and speech-therapist should be needed for symptomatic treatment and psychosocial well-being of the child.

Declaration of patient consent

These authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal patient identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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DHAKA NATIONAL MEDICAL COLLEGE & HOSPITAL
53/1, Johnson Road, Dhaka-1100, Bangladesh, Tel.: +88-02-47110089, 47118966-67, 223354699, 223354782
Fax : +88-02-9574700, E-mail : academic@dnmc.edu.bd, dnmcadmn@gmail.com, info@dnmc.edu.bd
Web : www.dnmc.edu.bd