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Acknowledgements

Acknowledgements, if any, should be placed at the end of the body of the text and be limited to no more than 100 words. This section may be used to acknowledge the help of those who do not qualify for authorship or to acknowledge funding, donated resources, or significant material contributions to the research.

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- concept of research work
- study design
- data collection or processing
- statistical analysis
- report writing

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An official organ of Ad-din women's medical College

Editorial

Epigenetics- New thinking at present era

What is epigenetics? Epigenetics (epi- is Greek for above) involves changes in the genes that do not involve changes to the sequence of DNA that makes up those genes. Rather, epigenetic changes involve a host of chemical modifications that serve to "mark" certain genes. Modifications include adding molecules, like methyl groups to the DNA. This changes the appearance and the structure of DNA this allows how that gene can interact with the transcribing molecules in the cell's structure.

Epigenetics refers to changes in gene function that do not alter its underlying structure of DNA but result in genes being switched on or off in a reversible way. Environmental exposures that occur throughout a person's lifetime (from fetal life through old age) can not only cause somatic mutations within DNA but also affect how genes function and whether they are turned on and off without changing the DNA sequence. Although the field of epigenetics may seem a matter for biochemists and basic scientists, there are many clinically relevant aspects that require an understanding by all physicians, especially pediatricians. Epigenetic principles are currently used for diagnosis and treatment of some childhood diseases and will likely be used in the near future for predicting and preventing disease. Adverse maternal exposures during pregnancy are thought to be especially important for later disease development because establishment of epigenetic markers occurs during fetal development. The field of epigenetics includes any mitotically or meiotically heritable change that does not change the actual DNA sequence. Adverse maternal exposures during pregnancy are thought to be especially important for later disease development because establishment of epigenetic markers occurs during fetal development. Epigenetic mechanisms regulate gene expression, making it possible for genes to function differently in various tissues. This system also allows a more flexible way to respond to each individual's to environment. Because of this adaptability, epigenetic mechanisms have been suspected or identified in most diseases, including cancer, diabetes, obesity, asthma, and cardiovascular disease. Exposures throughout life, including toxins, diet, and stress, can influence epigenetic processes.

Pediatric pulmonologist Pamela Zeitlin observed two young boys who happen to have the same exact mutation in the gene responsible for cystic fibrosis, the inherited disease that causes severe mucous buildup in the lungs. Yet even a quick glimpse might reveal the two do not share the same severity of symptoms, for while one patient seems relatively healthy, the other clearly struggles to take a breath. So, why do two young boys of similar age and background born with the identical genetic defect show such a disparity in their health? Why has the identity of the CFTR (cystic fibrosis transmembrane conductance regulator) gene as the underlying cause of the disease not been the cure-all that many researchers had hoped for? Rather than in the gene, the answer may lie quite literally above the gene, and involves an emerging field of science that pediatricians. The answer could be found in epigenetics.

Smoking and overeating can make the genes for obesity overexpress themselves and the genes for the longevity under-express themselves. Men who smoke before puberty tent to have sons who can't have higher body mass index and shorter life expectancies. Pregnant Women with high maternal anxiety are known to have children with asthma. Good news is that the scientists are learning to manipulate epigenetic marks and are trying to find out the drugs that will treat sickness by turning off the bad gene and by turning on the good gene. Scientists are now hoping to develop epigenetic drugs to help people with diabetes, cancer, Alzheimer's disease, schizophrenia and autism. Epigenetic mechanisms are external modifications of DNA that cause changes in gene function and are involved in many diseases. Specific examples of pediatric diseases with a known or suspected epigenetic component include Beckwith-Wiedemann syndrome, childhood leukemia, allergies, asthma, fetal alcohol spectrum disorders, childhood obesity, and type 2 diabetes mellitus. Currently, epigenetically active treatments are being used to treat childhood leukemia. Potential epigenetically active treatments and preventive regimens are under study for other diseases. Pediatricians need to be aware of the epigenetic basis of disease to help inform clinical decision making in the future.

Prof. Dr. Mahmuda Hasan
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Original Article

Outcome of Induction of Labour by Intracervical Catheterization in Eclamptic Patients in A Tertiary Care Centre

Nasrin Sultana[1], Jhuma Biswas[2], Kazi Morjina Begum[3], Shahnaz Akhtar[4], Nilufar Jahan[5], Rashida Khanom[6]

Abstract

Background: Induction of labour is a common obstetric procedure. Both mechanical (e.g., Foley catheters) and pharmacological methods (e.g., prostaglandins) are used for induction of labour in women with an unfavourable cervix. Eclampsia is a serious condition which requires urgent termination of pregnancy. Eclampsia may be associated with moderate as well as significant increases in blood pressure. The blood pressure can return to normal after delivery or may persist for a period of time

Objective: To determine the labour outcome in eclamptic patients by intracervical catheterization.

Material and Methods: This study was undertaken among the patients admitted in the Department of Obstetrics and Gyrtaecology, Dhaka Medical College Hospital during the period from January 2014 to June 2014. Intracervical catheterization were applied in 52 cases. All the pregnant women whose induction done by intracervical catheterization in eclamptia ward in DMCH

Results: This study found mean age of the patients was 28.86±4.26 years ranging from 22 to 35 years. Regarding gestational age 61.5% were 32-35 weeks of gestation followed by 23.1% were 28-31 weeks and another 15.4% were >35 weeks of gestation. Most (66%) of the patients were primigravida. Most of the patients (48.1%) were no antenatal checkup. On analyzing the presentation of the patients 76.9% had severe HTN (diastolic BP >110 mm of Hg). Majority of the patients were conscious and had oedema (90.4%). About 48.1% patients were anaemic and knee Jerks were absent in 56% cases. Maximum (69.2%) were spontaneous vaginal delivery followed by 11.5% were prolonged labour, 7.7% were caesarean section, 5.8% were failed induction and 5.8% were obstructed labour. Maximum 75% had average bleeding, 9.6% had PPH, 5.8% had puerperal sepsis and 5.8% had chorioamnionitis. It was observed that the induction delivery interval was about 80.8 delivered within 20 hours and 19.2% delivered >20 hour. With regards to perinatal outcome this study found 65.4% were live birth. Among 17.3% were found birth asphyxia.

Conclusion: This study shows intracervical catheterization achieved successful induction of labour in women with eclampsia and shorten the time of induction delivery interval.

Introduction

Bangladesh is one of the top listed countries in the world as far as maternal & neonatal morbidity rates are concerned.[1] The incidence of eclampsia is extraordinarily high in Bangadesh-7.9% (not including pre-eclampsia) according to the results of a house to house survey.[2] A study carried out in developed countries has shown that 31.3% cases of eclampsia is not preventable despite of adequate antenatal care & hospital admission.[3]

Eclampsia is associated with elevated maternal & fetal morbidity & mortality. Global estimates of the incidence of eclampsia project about 50,000 maternal deaths due to eclamptic fits each year[4]. It is uncommon in developed countries & 20 times more common in developing countries. In developed countries, eclampsia complicates about 1 in 2000 deliveries.[5] In developing countries, the prevalence of eclampsia varies widely from 1 in 100 to 1 in 1700.[6]

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In recent times, more & more pregnant women around the world have undergone induction of labour. Labour is induced in about 20% of pregnant women in high-income countries, making it one of the most frequently done obstetric interventions.[7] In developing countries like Bangladesh, the rates are generally lower. A variety of techniques for induction of labour have been studied over the decades. The incidence of labour induction for shortening the duration of pregnancy has continued to rise which is a healthy sign.

The procedure of induction of labor by intracervical catheterization is a 30-mL to 50-mL Foley catheter filled with saline is effective in inducing cervical ripening and dilation. The catheter is placed in the uterus, and the balloon is filled. This direct pressure causes stress in the lower uterine segment and probably the local production of prostaglandins and labour pain starts.[8,9]

The use of an extraamniotic catheter, balloon inflated above the level of internal os of cervix, has been advocated as a non pharmacological, mechanical method of cervical ripening before onset of labor. It is suggested that ripening efficacy by catheter balloon is similar, or better, than other methods. This review also suggests that cervical ripening with extraamniotic catheter balloon has the advantages of simplicity, low cost, reversibility, and low risk of uterine hyperstimulation or uterine scar rupture.[10]

Materials and methods

It was a cross sectional observational study carried out Eclampsia unit, Department of Obstetrics and Gynaecology, Dhaka Medical College and Hospital From February 2014 to August 2014. The antepartum eclamptic patients admitted in eclampsia unit of DMCH during the study period with fulfillment of inclusion criteria. Total 52 samples were taken. Data was collected using a structured questionnaire containing all the variables of interest. The questionnaire was finalized following pre-testing. The data were processed in the computer and analyzed by SPSS (Statistical package for social science) for windows version 20.

Results

Table I: Age distribution of patients (n=52)

Age in years	Frequency	Percentage	Mean±SD
21-25	13	25	28.86±4.26
26-30	24	46.2	
31-35	15	28.8	

Table II: Clinical presentation of the patients (n=52)

Presenting features	Frequency	Percentage
Consciousness	12	23.1
Semiconscious	31	59.6
Unconscious	9	17.3
Number of convulsion		
1	11	21.2
2	33	63.5
3	8	15.4
Headache		
Present	48	92.3
Absent	4	7.7
Epigastric pain		
Present	40	76.9
Absent	12	23.1
Blurring of vision		
Present	43	82.7
Absent	9	17.3

Table III: Distribution of the patients by maternal outcome (n=52)

Maternal outcome	Frequency	Percentage
Spontaneous vaginal delivery	36	69.2
Prolonged labour	6	11.5
Obstructed labour	3	5.8
Failed induction	3	5.8
Caesarean section	4	7.7

Table IV: Distribution of the patients by birth out come (n=52)

Birth outcome	Frequency	Percentage
Prematurity	34	65.4
Birth asphyxia	9	17.1
Still birth	11	21.2
IUD	7	13.5

Table V: Distribution of the patients by maternal complication (n=52)

Maternal complication	Frequency	Percentage
PPH	5	9.6
Chorioamnionitis	3	5.8
Puerperal sepsis	5	9.6
None	39	75.0

Table VI: Time of interval between induction & delivery (n=52)

Time interval	Frequency	Percentage
≤20	42	80.8
>20	10	19.2

Table shows 80.8% were ≤20 hours time interval between induction & delivery and 19.2% were >20 hours time interval between induction & delivery.

Table VII: Duration of hospital stay (n=52)

Duration (days)	Frequency	Percentage
1-5	41	78.8
6-10	11	21.2

Discussion

This study found mean age of the patients was 28.86±4.26 years ranging from 22 to 35 years. About half of the patients were in the age group 26-30 years (46.2%) followed by 28.8% were age group 31-35 years and low in the age group 21-25 years (25%). This findings consisted with Okafor which was 28.4 years (range 17-40 years)[11] Sami et al. found 46% in <20 years age group, 6% in 20-30 years, 12% in 30-40 years and 36% in > 40 years.[12] Another study Swain et al. found 5.2% in < 20 years, 1.5% in 21-30 years and 1.6% in > 30 years age group.[13]

This study showed all patients received loading dose $MgSO_4$ after development of convulsion. Sibai[14] identified that magnesium sulfate is the drug of choice for reducing the rate of developing eclampsia in intrapartum and immediately postpartum period. LaRusso[15] suggested that magnesium sulfate may reduce the risk of maternal death during labour and delivery.

In this study shows maximum (69.2%) were spontaneous vaginal delivery followed by 11.5% were prolonged labour, 7.7% were caesarean section, 5.8% were failed induction and 5.8% were obstructed labour. Maximum 75% had no any complication followed by 9.6% had PPH, 9.6% had puerperal sepsis and 5.8% had chorioamnionitis. Almost similar complications were observed Dharmavijaya et al.[16] and Barrilleaux et al.[17]

In the present study it was observed that the induction delivery interval was about 80.8 delivered within 20 hours and 19.2% delivered >20 hour. Similar observations were observed by Dewan et al.[18] Another study by Sciscione et al.[19] showed 20 hours induction delivery interval. Minimum time requirement was 6 hours and 'maximum was 23 hours.

With regards to perinatal outcome this study found 65.4% were live birth. This study has similarities with study conducted by Siddiqui et al.[20] Once the patient developed eclampsia continuation of pregnancy is not recommended. So termination was done irrespective of gestational age.

Conclusion

This study shows intracervical catheterization for labour induction is very effective and shorten the time of induction delivery interval and should be considered for use in clinical practice. The intracervical catheterization catheter could make it particularly useful in resource-limited settings. This study has also shown that the use of intracervical catheterization to induce labour is very effective and would hardly end in failed induction. We feel that using the intracervical catheterization is effective for Bangladeshi women. Therefore we recommended that traction be applied to intracervical catheterization when it is being used for pre-induction cervical ripening so as to reduce the induction-delivery interval.

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Original Article

Early Experience of Total Extraperitoneal Inguinal Hernia Repair

Md. Ezharul Haque Ratan[1], Hasina Alam[2]

Abstract

Objective: Inguinal hernia is a common surgical condition. Open hernioplasty is a traditional procedure practiced for decades all over the world. But the newer procedure of Total Extraperitoneal (TEP) inguinal hernia repair is the current trend in Western World. Researchers are trying to cope with the recent trend and initiate and practice TEP in BIRDEM.

Methods: This observational analytic study was done during April 2012 and March 2015. All inguinal hernia patients reporting to BIRDEM outpatient department were approached for TEP. Those who consented were treated electively with a TEP repair for a unilateral or bilateral hernia defect, either direct or indirect. A total of 50 patients, all adult males (over 18 years) were included in this study. All procedures were completed with patients under GA. Polypropylene mesh was placed in preperitoneal space. All patients were followed up in outpatient department in one week, one month, one and two years after surgery. Patients' age, hernia types and locations, complications, length of stay in hospital, return to work and recurrence were noted.

Results: Patients' age was between 22years and 72years. All of them had primary hernias and 72% of them underwent unilateral repairs. None of the cases required conversion to TAPP or anterior procedures. In two patients (4%) intraoperative complication occurred and post-operative courses were complicated in 3 patients (6%). Patients were able to resume their daily activities after a mean period of 7 days (3 to 10 days). None required a readmission and there were no mortality.

Conclusion: In patients with uncomplicated inguinal hernias, TEP is associated with a very low overall risk of serious complications and recurrence with a very good functional outcome. It is equally applicable with bilateral inguinal hernias as well, without added risk. It must be concluded that it is very much possible to perform TEP successfully even with limited resource and without any added expenditure.

Key words: Inguinal hernia, Total Extraperitoneal (TEP)

Introduction:

Inguinal hernia repair is one of the most common surgery and over twenty million procedures are done every year across the globe[1,2]. The most common standard open technique of tissue based suture repair had few changes over a hundred years[3]. Use of a synthetic mesh for a tension free repair has revolutionized hernia surgery with a significantly lower recurrence rate[2,4] and lower chronic post-operative pain[5]. The development of laparoscopic technique to cover the myopectineal orifice with a mesh placed in preperitoneal space might be the next big change in hernia repair[3, 6].

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Since the first reported case in 1992[7] endoscopic repair of inguinal hernia is becoming an increasingly popular method (16.8% to 41%) in USA[8, 9] as an alternative to open hernioplasty. This minimally invasive technique has the benefits of lower wound infection, faster wound recovery, reduced post-operative stay, less pain, better cosmetic outcome, and earlier return to physical activity and work[5, 10-14] and less chronic pain[15]. Disadvantages of the technique include a higher risk of serious intraoperative complications, has to be performed under general anaesthesia and sizeable learning curve to master the technique[5, 10, 16]. Among the two alternative approaches Trans Abdominal Pre Peritoneal (TAPP) and Total Extra Peritoneal (TEP), some author concluded that both are safe and effective[17,18], while others preferred TEP since it can avoid entry into the peritoneal cavity and consequently, possible intraperitoneal complications[6]. Since 2010, TEP has been performed in this hospital. In the present study, outcome of TEP inguinal hernia repair (IHR) was analyzed.

Methods:

An observational analysis was done in all cases of inguinal hernia who had undergone TEP repair between April 2012 and March 2015. A total of 50 patients were treated electively with TEP repair for a unilateral or bilateral hernia defect. They were either direct or indirect inguinal hernia cases. A total of 64 procedures were done, where bilateral repair was counted as two separate surgical procedures. All adults (over 18 years) were included in the study including patients who had concomitant procedures at the same time of inguinal hernia repair. Patients with incarcerated hernia and those deemed unsuitable for surgery under general anaesthesia (GA) were excluded from the study. All the procedures were performed on an ambulatory care basis. Post-operative follow up was made in the outpatient department.

Patients were asked to void just before operation. All procedures were completed with patients under GA and supine Trendelenberg position with upper limbs tucked at the sides.

An infraumbilical vertical incision of 1.5 cm was made, blunt dissection of subcutaneous fat was done to expose the Linea Alba which was opened transversely and care was taken not to breach the parietal peritoneum. Blunt dissection was made with a hemostat in the extraperitoneal space aimed towards the pubis in the midline. A 10 mm trocar was placed, carbon dioxide inflation was done and a pressure of 10-12 mm was maintained. A zero degree 10 mm telescope was introduced and blunt dissection was done with the tip of the telescope keeping close to the peritoneum, first towards the pubis and then to the side of the hernia to the level of the anterior superior iliac spine. Indirect hernia sac was reduced high enough to hold down behind the mesh at the conclusion of the procedure. Medial dissection was extended across the midline to opposite side halfway to epigastric vessels. Polypropylene mesh (15x10 to 15x12 cm^2 sizes) was folded in halfway with 3 sutures. Then folded completely and introduced through the 10 mm cannula, then freed, half uncurled and laid flat to cover the space below the inguinal ligament. Spiral tacks were then used to fix the mesh. The sutures were then removed to uncurl the other half of the mesh to cover the space above the inguinal ligament, thus covering the hernia sites – inguinal, femoral and obturator. A similar technique was performed on the opposite side if warranted. The hernia sac was placed behind the mesh, hemostasis secured, deflation and closure of the fascial and skin incision were performed.

All patients were followed up in outpatient department in one week, one month, one and two years after surgery. Date analysis was done in following outcome items- Patients' age, hernia types and locations, complications, length of stay in hospital, return to work and recurrence.

Results:

Between April 2012 and March 2015 a total of 50 consecutive adult patients underwent TEP IHR under GA (Table I & II). All of them were men with age range 22 to 72years.

Thirty two percent having an American society of Anesthesiologists (ASA) score of 1, 62% of 2 and remaining 6% an ASA score 3. Mean duration of complaints was 2 years (3 months to 12 years). All of them had primary hernias and 72% of them underwent unilateral repairs. None of the cases required conversion to TAPP or anterior procedures. The mean operation time for unilateral and bilateral cases was 55(45 to 65) minutes and 85(70 to 100) minutes respectively.

In two patients (4%) intraoperative complication occurred and post-operative courses were complicated in 3 patients (6%) (Table III). Excessive bleeding during operation occurred in 2 patients, one while the peritoneum was peeling off from obturator area and another due to injury to a branch of the epigastric vessel during retraction of the peritoneum off the triangle of doom. Both were managed endoscopically by gauze pressure and limited cautery. None required blood transfusion, none of the complications was associated with general anaesthesia. Two patients developed seromas noticed at one month follow up and were managed expectantly. In one patient recurrence was observed in 1 year follow up that was subsequently treated with a Lichtenstein procedure.Post-operative pain was mild in all case. Two patients complained of persistent pain at one month which were treated by reassurance and analgesics. Patients were able to resume their daily activities after a mean period of 7 days (3 to 10 days). None required a readmission and there were no mortality.

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

Age (yrs)	**21-30**	**31-40**	**41-50**	**51-60**	**>60**
No. of pts	5	11	14	11	9

Table II: Patient and hernia characteristics

Variables	Data
ASA	
1	16(32%)
2	31(62%)
3	3(6%)
Location of Hernia	
Unilateral	36(72%)
Bilateral	14(28%)
Duration of complaints	2 years (3months-12years)
Number of procedures	64
Duration of operation	
Unilateral	55(45 to 65) minutes
Bilateral	85(70 to 100) minutes

Table III: Complications

Variables	Data
Mortality	0(0%)
Intraoperative Complication	
Bleeding	2(4%)
Postoperative Complication	
Seroma	2(4%)
Recurrence	1(2%)

Discussions:

All the patients in the present study of inguinal hernia were male, as we found in open surgery as well. The reason behind very low incidence of female groin hernia surgery in our setup may be due to socioeconomic and religious state. The incidence of bilateral inguinal hernia has been variably reported in literature based on clinical examination alone (6%)[19], routine contralateral exploration[20] and with laparoscopy[21, 22]. We offered and did bilateral TEP IHR in those presented with bilateral inguinal hernias and those with a unilateral direct inguinal hernia as the incidence of future development of a direct hernia on the other side is more in case of direct inguinal hernia.

All of our cases were done under GA

any anaesthesia related hazards. In the post-operative period ketorolac trimethamine was our analgesic of choice unless contraindicated when tramadol hydrochloride was the alternative. None required pethedine or morphine.

The mean operation time for unilateral case was about an hour or so, those for bilateral cases 85 minutes. Literatures suggested that operation time depends on the experience of the surgeon and it drops below an hour only after a century of procedures were performed[23]. TEP has a long learning curve compared to Trans-Abdominal-PrePeritoneal (TAPP) hernioplasty procedure[24].

Bleeding occurred intraoperatively twice during very early cases, certainly related to inception with the new procedure, though not severe, not eventful, this never happened once surgeon became familiar with the relatively avascular pre peritoneal space and dissecting closer to peritoneum.

This study does not encounter bladder or bowel injury though some publications reported TEP procedures to have higher incidence of serious perioperative complications than open procedures[25, 26]. Another study reported that bilateral TEP was associated with significantly higher reoperation and urinary bladder injury ralated[27] while Mark A et al suggested that bilateral repair does not have notably higher risks or mortality than a unilateral repair[28]. Seroma in the inguinal area were encountered in two patients and none required intervention. Flore Varcus et al also reported that many patients had some degree of seroma that did not require drainage[3]. Lau et al concluded that old age, large hernia defects, scrotal hernias and left behind residual distal sac were associated with seroma formation[29].

The strength of the study is inclusion of all uncomplicated cases who were willing to undergo TEP IHR. Limitation of the study is its modest number of cases and potential selection bias as a substantial number of patients were excluded as they were operated by an anterior approach during study period due to financial constraints.

Conclusion:

In patients with uncomplicated inguinal hernias TEP is associated with a very low overall risk of serious complications and recurrence with a very good functional outcome. It is equally applicable with bilateral inguinal hernias as well without added risk.

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Original Article

Serum fasting blood glucose status in nursing mothers

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Abstract

Background: There is an association between breast feeding & maternal blood glucose status. Breast feeding improves maternal blood glucose status & may reduce the risk of developing type 2 diabetes.

Objective: To observe Serum fasting blood glucose level in nursing mother.

Method: The present cross sectional study was conducted in the Department of Physiology, Dhaka Medical College, Dhaka, during the period of July 2010 to June 2011. A total 300 subjects were included within the age limit from 20 to 40 years of women. Among them100 were normal healthy subjects & had child above 3 years were considered as group A (control). The rest 200 women were selected as study subject (group B) having child between the age 6 weeks to 2 years. Group B is again subdivided into group B_1 (100 lactating mother) & group B_2 (100 nonlactating mother). The subjects were selected from pediatric ward & OPD of pediatrics, DMCH and BSMMU, Dhaka. Data were collected in data collection sheet after taking informed written consent of the subjects. The study parameter is serum fasting blood glucose was done in the Department of Physiology, Dhaka Medicall College. The data were analyzed by computer with SPSS programs using unpaired Student 't' test.

Results: In the present study serum fasting blood glucose level in group B_1 was lower from group A and in group B_2 was significantly higher than that of group A. Within the study groups these values were significantly higher in nonlactating mother than lactating mother. It was observed that high level of study parameter were more in B_2 than that of group B_1. **Conclusion**: From the results of the present study it may be concluded that lactation has effect on lowering serum fasting blood glucose.

Key words: Lactation, diabetes, serum fasting blood glucose.

Introduction:

Breast feeding is the preferred method of feeding infants up to first 12 month of age[1]. Breastfed infants experience fewer & less severe infections and may be protected against future disease development[2]. Mothers who breast feed potentially experience accelerated weight loss, lower risk of development of breast and ovarian cancer[3], improves metabolic status[4], lower risk of type 2 diabetes[5] or the metabolic syndrome in later life than nonlactating mother[6].

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Type 2 diabetes mellitus affects about 9 million adult women in the United States. This disease and its complications impose a considerable burden on the health care system[7]. Multiple lifestyle factors, including diet, exercise and obesity are associated with risk of diabetes[8].

Pregnancy is a critical period for weight gain and obesity in women[9]. There is physiological insulin resistance has been observed in the last trimester of gestation. Which possibly increase glucose utilization by placenta and fetal tissues[10,11,12]. Insulin resistance could also increase insulin bio-availability for mammary tissue which regulates mammary gland lipoprotein lipase enzyme[13].

Lactation imposes a substantial metabolic burden on mothers, with an increased requirement of approximately 480 kcal/ d[14,15,16]. Both human studies and animal models have demonstrated improved insulin

sensitivity and glucose tolerance during lactation compared with nonlactating mothers[17,18].

Many investigators of different countries studied metabolic syndrome by measuring the fasting blood glucose, serum insulin and insulin resistance in lactating & nonlactating women. They found that lactation has effect on insulin & glucose homeostasis. lactating women had significant lower fasting glucose levels and insulin level among lactating versus nonlactating women. They also found improved glucose metabolism with recent gestational diabetes compared to nonlactating women[15,19] .

Some author found that breast-feeding history was inversely associated with insulin resistance, independent of obesity[9,20] .

Another study said that long term breastfeeding has more of a delaying effect than a prevention effect on diabetes, especially in women with very strong risk factors for the diabetes. Another interesting finding was that the longer the period of exclusive breast feeding per pregnancy, the greater the effect against diabetes[21,22].

The American Academy of Pediatrics recommends that all infants should be exclusively breast feed through 6 months of age and that breastfeeding should continue until the infant is 1 year of age. Although 80% of US women initiate lactation, only 36 % report breast feeding and 14% report exclusive breast feeding their infants at 6 months of age [2].

Bangladesh is a country usually noted for prolonged breast-feeding. A research work found that 60% of infants were being exclusively breast-fed and 30%, predominantly breast-feed at the time of discharge from hospital. After 2 weeks at home, 75% of the mothers were breast-feeding exclusively but 25% of mothers failed to continuing exclusive breast-feeding, despite of having been counseled during their hospital stay [3].

As breast feeding has become a global heath issue. Its importance should informed to all mother both working and nonworking. As many of them failed to continue breast feed exclusively or adequately. Bangladesh government is very concern about breast feeding issue & takes multiple programs for improving and awareing people about breast feeding. In Bangladesh little work were done on The present study has been designed to assess the Serum fasting blood glucose status of lactating mother as well as in nonlactating mother.

Lactation has effect on lowering Serum fasting blood glucose level. Present study will provide us knowledge about beneficial effect of breast feeding on maternal health, which will increase the public awareness of breast feeding among nursing mothers.

Methods

It was a cross sectional study, carried out in the Department of Physiology, Dhaka Medical College, Dhaka from July, 2010 to June, 2011. A total number of 300 female subjects were included within the age of 20-40 years**.** Group A (control): Consists of 100 apparently healthy, non gravid & nonlactating mother having child of age above 3 years or mother not in lactation period (to compare with study group).

Group B (study group): Consists of 200 female subjects having baby between 6 weeks to 2 years or mother in lactation period but not in purperium (the period of purperium is avoided as most of the physiological changes during pregnancy revert back to normal with in this period) Group B is again divided into group B_1: 100 lactating mother, B_2: 100 non lactating mother. All subjects were selected from the pediatric indoor & out door, of Dhaka Medical college Hospital (DMCH) and from BSMMU, Dhaka. All the subjects were belonged to middle socioeconomic status. Pregnant mother with baby below 2 years or mother having adopted child or mother having baby < 6 weeks (as it is the period of puerpurium) were excluded from the study. Mother with heart disease, liver disease or kidney disease or any endocrine disease like thyroid disease were also excluded. After selection of subjects the purpose of the study was explained to each subject with a cordial attitude giving emphasis on the benefits they would obtain from the study. They were encouraged for their voluntary participation. They were also allowed to withdraw themselves as soon as they wish. All the subjects were requested to be empty stomach before giving blood sample. Before taking blood sample an informed written consent was taken from each subject. Then blood was collected. Ethical clearance was taken from ethical review committee of Dhaka Medical College. Data was collected in a predesigned data collection sheet. With all aseptic precaution finger was pricked & fasting blood glucose was measures by using portable glucometer. statistical analysis were done by Student's unpaired 't' test. Correlation was analyzed by Pearson's correlation test. P value < 0.05 was taken as level of significance

Results

Fasting blood glucose

The mean (± SD) fasting blood glucose were 96.08 ±16.24, 93.76 ±11.57 & 113.45 ± 32.51 mg /dl in group A, B_1 & B_2 respectively.

Fasting blood glucose level in lactating mother was lower than that of control group but was statistically not significant. In case of nonlactating mother the level was higher than that of control as well lactating mothers, both were statistically highly significant(p< 0.001).

The mean (± SD) duration of lactation of the child are 11.99 ± 6.88 & 3.42 ± 1.68 months in group B_1 & B_2 respectively.

The duration of lactation of the child in lactating mothers was higher than that of group nonlactating mothers & was statistically highly significant (p< 0.001).

When correlation was done between the fasting blood glucose level & mean duration of lactation it showed negative correlation (r= - 0.212) in lactating mothers but positive correlation (r = + 0.195) in nonlactating mothers. But the relation was statistically not significant in both case.

From the frequency distribution we can see more nonlactating mothers show high level of fasting blood glucose than others groups.

Table-I: Fasting blood glucose in different groups (n=300)

		Fasting blood glucose (mg/dl)
Groups	**n**	**(Mean±SD)**
A	100	96.08±16.24
B_1	100	93.76±11.57
B_2	100	113.45±32.51
Statistical analysis		
Fasting blood glucose		
Groups		**(p value)**
A vs B_1		0.246^{ns}
A vs B_2		0.0001^{***}
B_1 vs B_2		0.0001^{***}

Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated and p values <0.05 was accepted as level of significance.

Group A : Mother not in lactation period (Control group)

Group B : Mother in lactation period (study group)

Group B_1 : Lactating mother

Group B_2 : Nonlactating mother

n = Number of subjects

ns = Not significant

*** = Significant at P<0.001

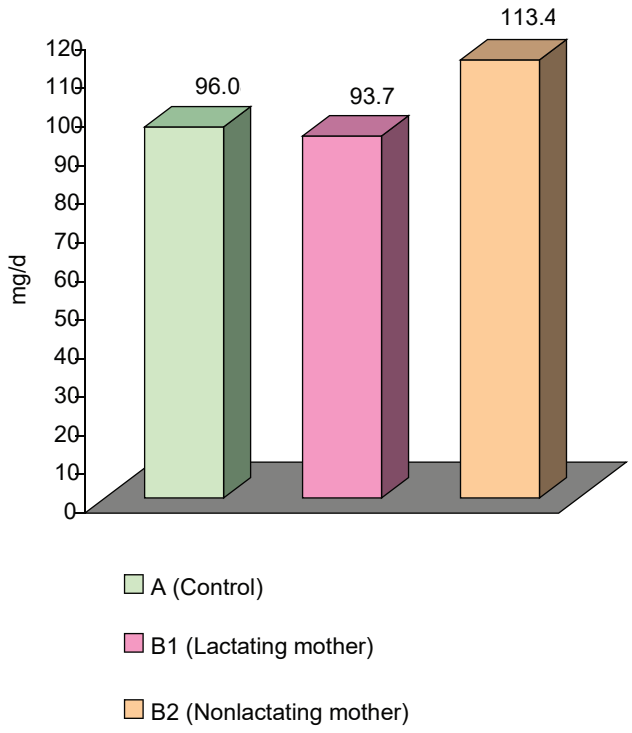

Fig.-1 : Mean fasting blood glucose in different groups

Table II: Duration of lactation in lactating and nonlactating groups(n=200)

		Duration (months)
Groups	**n**	**(Mean±SD)**
B_1	100	11.99±6.88
B_2	100	3.42±1.68
Statistical analysis		
Groups		Duration (p value)
B1 vs B2		0.0001***

Unpaired Student's 't' test was performed to compare between groups. The test of significance was calculated and p values <0.05 was accepted as level of significance.

Group B1 : Lactating mother

Group B2 : Nonlactating mother

n = Number of subjects

*** = Significant at P<0.001

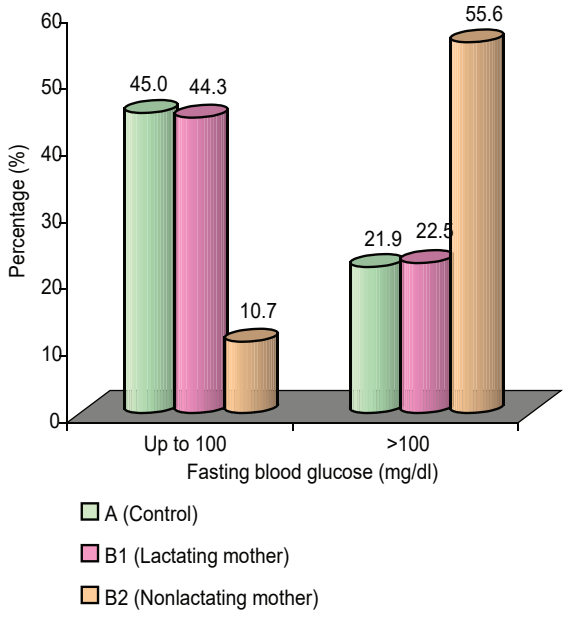

Fig.-2 : Frequency distribution of subjects by fasting blood glucose in different groups

Discussion :

The present study was carried out to observe serum fasting blood glucose in lactating(group B_1) & nonlactating mother (group B_2) and also in age matched apparently healthy adult female who are not in lactation period (group A) for comparison.

Distributions of the parameter was observed among the groups &was also correlated with duration of lactation in both study groups to observe any relationship with the duration of lactation.

In the present study, findings of all the parameters in healthy subjects or baseline control group were almost within normal range and also similar to those reported by the other investigators from different counties [11,12,7]. However no published data of the study parameter of lactating mother are available for comparison in our country.

In the present study serum fasting blood glucose level of lactating mother was nonsignificantly lower than that of normal subjects. FBG level in nonlactating mother

was significantly ($p<0.001$) higher than normal subjects .Lactating mothers showed significantly lower level of FBG than nonlactating mothers. Fasting blood glucose level showed negative correlation in lactating mother & positive correlation in nonlactating mother with the duration of lactation. Fasting blood glucose > 100 mg/ dl were observed in 33(21.9%), 34(22.5%), 84(55.6%) subjects in group A, B_1, B_2 respectively.

Similar type of findings were reported by some authors they found that insulin levels & insulin: glucose ratios were significantly lower in lactating mother than nonlactating mother. They suggest that independent of body adiposity breast feeding has long lasting protective effect on lowering fasting blood glucose level [18,20,21,22].

Some investigators found significantly lower fasting glucose & insulin levels in lactating than nonlactating women at 8 week postpartum. They also found that prevalence of type 2 diabetes was half in lactating than nonlactating group [20, 22]. This is due to preferential use of glucose by mammary gland. These study are also in agreement with the present study.

Some other stated that lactation has beneficial effect on glucose tolerance to women with history of GDM. They also suggested that lactation has post weaning effect on maternal metabolic profile [15,16] .

On the other hand some found that duration of lactation was inversely associated with risk of type 2 diabetes in young & middle aged women by improving glucose homeostasis[23]. This study is in agreement with the present study.

During lactation body weight decreases as lactation alters maternal fuel metabolism and increases energy expenditure by 15-25%. About 400 – 500 Kcal /day required for milk production during the first 6 months for exclusive breastfeeding[20].

Persistent of Pregnancy related metabolic change in fat distribution specially central adiposity is of greater importance than over all obesity, because intra abdominal (visceral) fat may associated with development of obesity related insulin resistance and production of adipocytokines that regulate insulin sensitivity[20]. Excess adipose tissue releases several products that apparently exacerbate metabolic risk factors. They include nonesterified fatty acids (NEFA), cytokines and adiponectin. A high plasma NEFA level overloads muscle and liver lipid, which enhances insulin resistance[24].

After parturition there is change from overall insulin resistance to insulin sensitivity. Low insulin levels lead to increase fat mobilization and transfer to the mammary gland. Insulin stimulates glucose and lipogenesis and controls mammary gland lipoprotein lipase. As a result lactating women exhibit lower blood glucose & insulin

concentrations along with higher rates of glucose production and lypolysis compared with nonlactating women[17,18].

Conclusion

Lastly it can be concluded that lactation increases metabolic demand & thus has significant effect in lowering fasting blood glucose level. Further studies can be done in gestational diabetic mothers to see the effect of lactation on FBG.

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Original Article

Mode of Delivery in Hypertensive Disorder of Pregnancy and Fetomaternal Outcome

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Abstract

Hypertensive disorder of pregnancy is a leading cause of maternal and perinatal mortality and morbidity. Along with control of blood pressure, control or prevention of convulsion,management of other complications, the management of hypertensive disorder of pregnancy comprises timely delivery. This prospective study evaluated the incidence of obstetrical interventions and maternal and fetal outcome in hypertensive disorder of pregnancy. During its sixmonths study, 2365 women were admitted in maternity unit of Dhaka Medical College Hospital**.** Among them 329 patients were documented to have various hypertensive disorders (incidence rate is 13.9%). Within these, 50 patients 17 (34%) patients had gestational hypertension. Thirty one (62%) had normal vaginal delivery and 17 (34%) had cesarean section. Eight subjects (53.3%) with pre-eclampsia and 6 (54.5%) women with eclampsia underwent caesarean sections. Rate of caesarean section was higher in primigravida (43.5%) compared to multipara (26%). Out of 11 patients with eclampsia 5(45.5%) developed various complications in combination or alone. There was no maternal death among either group. The study also analyzed the fetal outcome of 50 mothers prospectively. Among 48 live births, 10 (20.8%) babies were of low birth weight, which included both premature (14%) and intra uterine growth retardation babies (6%), 2 babies were below 1 kg (4.1%), 36 (72%) babies were healthy, 2 babies were still birth. Nine (19.6%) babies developed jaundice but 35(76%) babies had no complications after birth. Perinatal mortality was highest in eclamptic patients followed by pre-eclampsia (6.7%) and gestational hypertension (5.9%).

Key words : Hypertension, maternal, pregnancy.

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Introduction:

Bangladesh was one of the top listed countries of the world as far as the high maternal and neonatal mortality rates were concerned. Recently Bangladesh improves a lot on this field and earned award from United Nations for reducing maternal death which was one of the prime concerns of Millennium Development Goal (MDG). The 4th Health, Population and Nutrition Sector Program 2017–2022 has set the target of reaching an maternal mortality rate of 105 per 100,000 live births in 2022[1]. In spite of different preventive approaches to improve the obstetric care in Bangladesh, hypertensive disorders during pregnancy still contributes to 16 percent of maternal mortality[2].

Hypertension is the most common medical problem encountered in pregnancy and remains an important cause of maternal and fetal morbidity and mortality. It complicates up to 8-15% of pregnancies and account for approximately a quarter of all antenatal admissions[3-5]. Among different forms of pregnancy associated hypertension, pre-eclampsia and

eclampsia has the highest impact on morbidity and mortality. Chronic hypertension may result in preterm and small for gestational age infants, even when it is mild to moderate. The objective of this study was to asses the complication of hypertension in pregnancy and its delivery mode with fetal and maternal outcome.

Materials and methods

This hospital based study was conducted in the department of Obstetrics and Gynaecology . Dhaka Medical College Hospital(DMCH) carried out from January 2013 to June 2013. All patients presented hypertensive disorders of pregnancy in Gynae & Obstetrics Department of DMCH within this 6 months were taken for the study. Inclusion criteria included alive fetus with singleton pregnancy and cephalic presentation. Screening was done by history and clinical examination. Non probability Purposive sampling technique was applied for the study. Patients having other obstetric indication for caesarean section like malpresentation, placenta Previa, previous caesarean section, fetal distress were excluded from the study. Eclampsia with complications such as Disseminated intravascular coagulation (DIC), Cerebro vascular accident (CVA), Renal Failure, Respiratory failure were also excluded.

Results:

During the period from January 2013 to June 2013, a total of 2365 pregnant women were admitted in the Gynae & Obstetrics Department of Dhaka Medical College Hospital**.** Among them 329 (13.9%) patients were documented to have hypertensive disorders of pregnancy.

Table I: Overall incidence of hypertensive disorders in pregnancy

Total number of admission	Number of patients have hypertensive disorders	Percentage
2365	329	13.9

Out of 50 patients with hypertensive disorders of pregnancy, 17 (34%)patients had Gestational hypertension and 04 (08%) women were noted to have Pre-eclampsia superimposed on chronic hypertension

Table II : Incidence of various hypertensive disorders of pregnancy (n =50)

Type of disorder	Number of cases (%)
Gestational hypertension	17 (34)
Pre-eclampsia	15(30)
Eclampsia	11(22)
Chronic hypertension	03(6)
Pre- eclampsia superimposed on chronic hypertension	04(8)
Total	50(100)

Among the patients 28% had severe hypertension and 62% patients admitted in hospital with hypertensive disorder had normal vaginal delivery .

Table – III : Grading of hypertension during admission in hospital with hypertensive disorders in pregnancy and their mode of delivery

Diastolic BP(mm of Hg)	Number of cases (Percentage)
91-100	16 (32%)
101-110	20(40%)
>110	14(28%)
Mode of delivery	**Number of cases (Percentage)**
Normal vaginal delivery	31(62%)
Caesarian section	17 34%
Vacuum extraction	1(2%)
Forceps delivery	1 (2%)

Obstetrical intervention in patients with pre-eclampsia (n=15) . Here 53.3% had caesarian section .

Table – IV: Sub group analysis – obstetrical intervention in patients with pre-eclampsia(n=15)

Mode of delivery	Number of cases	Percentage
Normal vaginal delivery	07	46.7
Caesarian section	08	53.3

Obstetrical intervention in patients with eclampsia (n=11). Here 6 (54.5%)cases had caesarian section.

Table – V : Sub group analysis – obstetrical intervention in patients with eclampsia (n=11)

Mode of delivery	No. of cases	Percentage
Normal vaginal delivery	04	36.36
Caesarian section	06	54.5
Vacuum extraction	01	9.09

Among primigravida out of 23 cases 10 (43.5%) needed cesarean section and on the other hand out of 27 multigravida 7 (26%) required cesarean section.

Table – VI : Mode of delivery according to parity (n=50)

Mode of delivery Primigravida(n=23)
Multygravida(n=27)

	No. of cases	Percentage	No. of cases	Percentage
Normal vaginal delivery	12	52.2	20	74
Caesarian section	10	43.5	7	26
Vacuum extraction	1	4.3	--	--

Out of 15 patients with pre-eclampsia, 4 (26.7%) developed various types of complications in combination or alone.

Table – VII : Incidence of maternal complications in patients with pre-eclampsia (n=15)

Complications	No. of cases	Percentage
Pulmonary oedema	1	6.7
Placental abruption	1	6.7
Acute renal failure	1	6.7
HELLP syndrome	1	6.7

Again out of 11 patients with pre-eclampsia, 5 (45.4%) developed various types of complications in combinations or alone.

Table – VIII : Incidence of maternal complications in patients with eclampsia

Complications	No. of cases	Percentage
Aspiration pneumonia	2	18.2
Pulmonary oedema	1	9.1
Acute renal failure	1	9.1
Placental abruption	1	9.1

Maternal outcome and complications in the two groups, among them cesarean delivery, blood transfusion, acute renal failure, aspiration pneumonia, HELLP syndrome, placental abruption and pulmonary edema are common on both groups.

Table – IX: Maternal outcome and complications in the two groups

Variable	Pre-eclampsia Number(%)	Eclampsia Number(%)
Cesarean delivery	8 (53.3%)	6 (54.5%)
Blood transfusion	2(13.3%)	3(27.3%)
Acute renal failure	1(6.7%)	1(9.1%)
Aspiration pneumonia	1(6.7%)	2(18.2%)
HELLP syndrome	1(6.7%)	X
Placental abruption	1(6.7%)	1(9.1%)
Pulmonary edema	1(6.7%)	1(9.1%)

Among the 48 live birth babies delivered, 10 (20.8%) babies were of low birth weight below 2.5 kg.

Table – X : Weight of live born babies (n= 48)

Weight (Kg)	Number of cases	Percentage
> 3.6	2	4.1
2.5 – 3.5	34	70.8
1.5 – 2.4	10	20.8
1.0 – 1.4	2	4.1

Immediately after delivery the baby were assessed in terms of birth weight and their correlation with gestational age, 72% babies were found healthy during their assessment. Out of 02 stillbirth 1 was macerated stillbirth and another had intrapartum death.

Table – XI : Overall fetal outcome (n=50)

Outcome	Number of cases	Percentage
Healthy	36	72
Premature	7	14
IUGR	3	06
Stillbirth	2	04
Death after delivery	2	04

There was all together 4 deaths with overall perinatal mortality 8%. Perinatal mortality highest in eclamptic patients(18.2%).

Table-XII : Foetal mortality according to disease pattern (n=4)

Variable	Number of cases	Percentage
Gestational hypertension (n=17)	1	5.9
Pre-eclampsia(n=15)	1	6.7
Eclampsia (n=11)	2	18.2

Here, 76% had no complications, 19.6% developed jaundice.

Table – XIII : Distribution of Perinatal morbidities

Disease	Number of cases	Percentage
Jaundice	9	19.6
Umbilical sepsis	1	2.2
Septicemia	1	2.2
No complication	35	76

Discussion

Gestational hypertension and pre-eclampsia constitutes major bulk of the patients in this study. Seventeen (34%) women were categorized as gestational hypertension and 15 (30%) subjects documented to have pre-eclampsia. There are 11 (22%) eclampsia cases in this series which is much higher compared to other published data. The incidence of eclampsia varies from 0.03 to 0.9% of deliveries, with significant maternal mortality, depending on the availability of high quality intensive care[6]. In a recently published series the incidence of eclampsia was 0.6% of the deliveries[7]. The incidence of eclampsia has decreased significantly in different developed countries due to tremendous improvement in antenatal and perinatal care. The data published in Singapore in the year 2006 reveals that the incidence of eclampsia is very rare in this country.

A series published from KK Women's and Children's Hospital. Singapore showed that out of 61,595 deliveries between the period of July 1999 and June 2003 only 10 cases were documented to have eclampsia. Overall incidence is only 0.02% which reflects very high quality antenatal care in that country.[8] The incidence of eclampsia is still quite high in our country mainly in lower socioeconomic class. In this study 64% patients with eclampsia were from lower socioeconomic group and 27% of subjects were form middle class group. No woman from upper class was noted to have eclampsia. This indicates that eclampsia is very uncommon if the pregnant woman gets proper antenatal care.

Out of 50 pregnant women with hypertensive disorders, 31 women had normal vaginal delivery (62%) obstetrical intervention required in 34% of cases. Out of 15 subjects with pre- eclampsia 7 women (46%) had normal vaginal delivery and 8 cases (53.3%) had caesarean operation. In the eclampsia group 4 cases (36.36%) had vaginal delivery and 6women (54.5%) underwent caesarean section.

The above mentioned data reflect that the incidence of obstetrical interventions in the present series particularly the rate of caesarean section in the pre-eclampsia and eclampsia are almost similar to the data from other developed countries. One series published in Journal of Indian Med. Assoc in recent past by Yadav et al showed relatively lower rate of caesarean section in hypertensive disorders of pregnancy. In that series rate of caesarean section is around 14.8%[9]. In another series published by Lee W et al revealed very high caesarean section rate in patients with eclampsia, which is 79%[10]. The rate of obstetrical interventions are very high in women with toxaemia of pregnancy. Even in United States more than half of women with pre-eclampsia and eclampsia undergo caesarean delivery [11].

In this series 31(62%) patients had normal vaginal delivery. 17 (34 %) patients underwent caesarean section operation. Around every third women required surgical intervention. This data is in agreement with other series published in recent past from other countries. In one series caesarean section rate was 48.1%[12]. Obstetrical intervention rate was higher in pre-eclampsia and eclampsia group. 53.3%of subjects in pre-eclampsia group and 54.5% from eclampsia had caesarean section. No patients with eclampsia required forceps delivery and 1 (9.09%) of eclampsia needed vacuum extraction. Foetal distress was the leading indication intervention in women with PE and failed induction was the leading cause of caesarean operation in eclampsia.

Women with pre-eclampsia and eclampsia has a 3 to 25 fold increased risk of severe complications, such as abruptio placentae, thrombocytopenia, disseminated

intravascular coagulation. (DIC), pulmonary oedema, and aspiration pneumonia[11]. Out of 15 patients with PE 4 patients (26.7%) developed various types of complications in combinations or alone. One patient (6.7%) developed the features of pulmonary oedema and 1 patient had placental abruption and another 1 patient progressed to eclampsia only one patient developed HELLP syndrome. Out of the 11 patients admitted with eclampsia 5 women (45.4%) had various types of complications. 18.2% of eclamptic women developed aspiration pneumonia and 9.1% had placental abruption. In a recently published series in 2006 maternal mortality rate was 9.4% in eclampsia[13].

In a recently randomized study the authors assessed the maternal complication rate in that study abruptio placentae (8.4%), HELLP syndrome (8.4%), acute renal failure (3.9%), pulmonary oedema (1.3%), postpartum encephalopathy (1.3%) were the leading maternal complications[14]. These complications were also the predominant causes of maternal morbidity and mortality in our current series.

None of the women died in this study. This indicated that obstetric outcome of gestational hypertension is excellent in tertiary hospital. In our series maternal mortality was 0%. Our findings are almost consistent with the randomized studies published in recent past. In one randomized study maternal mortality in gestational hypertension, PE and eclampsia were 1.8%, 4.8% and 6.4% respectively[15].

In this series 8 patients with pre-eclampsia underwent caesarean section operation, overall rate is 53.3% whether in eclampsia group 54.5% women underwent caesarean operation. The difference in caesarean operation rate in pre-eclampsia and eclampsia is not statistically significant. 2 patients with eclampsia developed aspiration pneumonia whereas 1 patient in the pre-eclampsia group developed this complication . One (1) patient (9.1%) had ARF in eclampsia and ARF also occurred in 1 woman (6.7%) in pre-eclampsia .

The incidence of perinatal mortality is very high in hypertensive disorders of pregnancy. Foetal complications include intrauterine death, IUGR, prematurity, brain damage and neonatal deaths.[16] Here analyzed the foetal outcome of 50 babies of 50 mother . 36 babies (72%) were apparently healthy, 7 babies (14%) were noted to have prematurity and 3 had IUGR (6%) 2 babies (4%) were stillborn. 2 babies died during one week after birth. There were all together 4 deaths with overall perinatal mortality 8%. Perinatal mortality was highest in eclamptic patients (18.2%) followed by pre-eclampsia 6.2%. 1 baby from a mother with gestational hypertension died, fatality rate 5.9%. Perinatal mortality has been documented to be higher in hypertensive disorder of pregnancy. A 12- year review of all the obstetric admissions in an intensive care unit published in 2006 revealed a significant prenatal and maternal deaths due to hypertensive disorders of pregnancy. This data showed 20% perinatal and 9.4% maternal mortality from these disorders[13].

Conclusion

This study has reflected the fact that there was no significant difference observed regarding maternal and perinatal morbidity. In hypertensive disorder there was no maternal death but perinatal mortality was highest among eclampsia followed by pre-eclampsia. Early detection and treatment will keep hypertensive disorder under well control and will reduce the incidence of severe pre-eclampsia maternal death and eclampsia. Cesarean section is preferred in many cases considering the fact that these patients and fetus may not tolerate the stress of labor.

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Review Article

Review on Dengue Fever

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Introduction:

Over the last five decades, dengue has emerged globally as a critical threat to population health. The World Health Organization (WHO) estimates that 50–100 million dengue infections occur each year and that almost half the world's population lives in countries where dengue is endemic.[1] Today, dengue ranks as the most important mosquito-borne viral disease in the world. The emergence and spread of all four dengue viruses (serotypes) represent a global pandemic. While dengue is a global concern, currently close to 75% of the global population exposed to dengue are in the Asia-Pacific region.

Dengue is the most rapidly spreading mosquito-borne viral disease of mankind, with a 30- fold increase in global incidence over the last five decades. It is a major public health concern throughout the tropical and subtropical regions of the world. Almost half the world's population lives in countries where dengue is endemic. According to World Health Organization (WHO), about 50–100 million new dengue infections are estimated to occur annually in more than 100 endemic countries, with a steady increase in the number of countries reporting the disease.

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Dengue has been identified as one of the 17 neglected tropical diseases by WHO as mentioned in their first report on neglected tropical diseases in 2010[2]. Although the full global burden of the disease is still uncertain, the patterns are alarming for both human health and the economy. Every year, hundreds of thousands of severe cases arise, of which 20,000 lead to death. The loss to the economy is 264 disability-adjusted life years (DALYs) per million population per year. Approximately 1.8 billion (more than 70%) of the population at risk for dengue worldwide live in South-East Asia Region (SEAR) and Western Pacific Region, which bear nearly 75% of the current global disease burden due to dengue. Of the documented 11 countries of SEAR, 10 countries including Bangladesh are endemic for dengue. The only exception is the Democratic People's Republic of Korea.[3] Approximately 0.29 million cases, of which Thailand contributed almost 30%, Indonesia 29% and India 20%. Similarly, Western Pacific countries have reported 0.33 million cases, of which Philippines contributed almost 52%, Vietnam 24% and Cambodia 14% (source WHO)[3]. The true numbers are probably far more, since severe underreporting and misclassification of dengue cases have been documented. Bangladesh scenario.

Overview

Dengue viruses cause symptomatic infections or asymptomatic sero-conversion.

Symptomatic dengue infection is a systemic and dynamic disease. It has a wide clinical spectrum that includes both severe and non-severe clinical manifestations[4] After the incubation period, the illness begins abruptly and, in patients with moderate to severe disease, is followed by three phases – febrile, critical and recovery (Figure 1). The severity of the disease will usually only be apparent around defervescence i.e. during the transition of the febrile to the afebrile phase,

which often coincides with the onset of the critical phase. The disease has its complex clinical manifestations, on the other hand management is relatively simple, inexpensive and very effective in saving lives. So correct and timely interventions are very crucial. The key to a good clinical outcome is understanding and being alert to the clinical problems that arise during the different phases of the disease with a rational approach in case management.

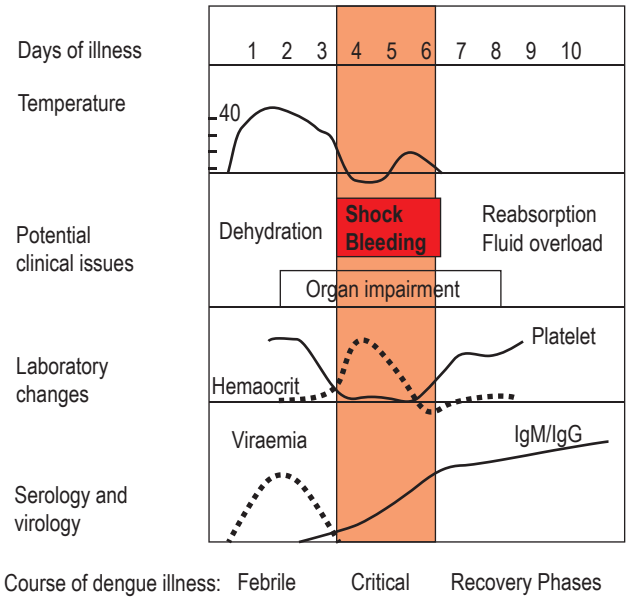

Fig.-1: The course of dengue illness

Febrile phase

Patients typically develop a high-grade fever suddenly. This acute febrile phase usually lasts 2-7 days and is often accompanied by facial flushing, skin erythema, generalized body ache, myalgia, arthralgia, retro-orbital pain, photophobia, rubeliform exanthema and headache[4]. Some patients may have a sore throat, an injected pharynx, and conjunctiva. Anorexia, nausea and vomiting are common. It can be difficult to distinguish dengue clinically from non-dengue febrile diseases in early febrile phase. A positive tourniquet test in this phase indicates an increased probability of dengue [5,6]. However, these clinical features do not predict the severity of disease. Therefore, it is crucial to monitor for warning signs and other clinical parameters in order to recognize progression to the critical phase. Mild hemorrhagic manifestations such as petechiae and mucosal membrane bleeding (e.g. of the nose and gums) may be seen[7]. Easy bruising and bleeding at venipuncture sites is present in some cases, gastrointestinal bleeding may occur during this phase although this is not common[7]. The liver may be enlarged and tender after a few days of fever[5]. The mearliest abnormality in the full blood count is a progressive decrease in total white cells count, which should alert the physician to a high probability of dengue[5]. In addition to these somatic symptoms, with the onset of fever patients may suffer from an acute and progressive loss in their ability to perform their daily functions such as schooling, work and interpersonal relations[8].

Critical phase

During the transition from the febrile to afebrile phase, patients without an increase in capillary permeability will improve without going through the critical phase. Instead of improving with the subsidence of high fever; patients with increased capillary permeability may manifest with the warning signs, mostly as a result of plasma leakage. The warning signs are mark at the beginning of the critical phase. Warning signs usually precede the manifestations of shock and appear towards the end of the febrile phase, usually between 3-7 days of illness. Persistent vomiting and severe abdominal pain are early indications of plasma leakage and become increasingly worse as the patient progresses to the shock state. The patient becomes increasingly lethargic but usually remains mentally alert. These symptoms may persist into the shock stage. Weakness, dizziness or postural hypotension occurs during the shock state. Spontaneous mucosal bleeding or bleeding at previous venipuncture sites are important hemorrhagic manifestations. Increasing liver size and a tender liver is frequently observed. However, clinical fluid accumulation may only be detected if plasma loss is significant or after treatment with intravenous fluids. These patients become worse around the time of defervescence, when the temperature drops to 37.5–38°C or less and remains below this level, usually on days 3–8 of illness. Progressive leukopenia [5] followed by a rapid decrease in platelet count usually precedes plasma leakage. An increasing haematocrit above the baseline may be one of the earliest additional sign of plasma leakage[9,10] . The period of clinically significant plasma leakage usually lasts 24–48 hours. The degree of plasma leakage varies. A rising haematocrit precedes, changes in blood pressure (BP) and pulse volume. The degree of haemoconcentration above the baseline, haematocrit reflects the severity of plasma leakage; however, this may

be reduced by early intravenous fluid therapy or due to haemorrhage. Hence, frequent assessment of haematocrit are essential because it indicates the need for possible adjustments to intravenous fluid therapy. A right lateral decubitus chest radiograph, ultrasound detects the free fluid in the chest or abdomen, or gall bladder wall oedema may precede clinical detection. In addition to the plasma leakage, haemorrhagic manifestations such as easy bruising and bleeding at venepuncture sites occur frequently. A rapid and progressive decrease in platelet count to about 100 000 cells/mm^3 and a rising haematocrit above the baseline may be the earliest sign of plasma leakage. This is usually preceded by leukopenia (≤ 5000 cells/mm^3)[6] .

Recovery phase

As the patient survives the 24-48 hour of critical phase, a gradual reabsorption of extravascular compartment fluid takes place in the following 48–72 hours. General wellbeing improves, appetite returns, gastrointestinal symptoms abate, stabilization of hemodynamic status and diuresis follows. Some patients have a confluent erythematous or petechial rash with small areas of normal skin, described as "isles of white in the sea of red" [11]. Some may experience generalized pruritus. The haematocrit stabilizes or may be lower due to the dilutional effect of reabsorbed fluid. The white blood cell count usually starts to rise soon after defervescence but the recovery of the platelet count is typically later than that of the white blood cell count. Respiratory distress from massive pleural effusion and ascites, pulmonary oedema or congestive heart failure will occur during the critical and/or recovery phases if excessive intravenous fluids have been administered and if intravenous fluid administration continues even after cessation of plasma leakage. Clinical problems during the different phases of dengue are summarized in Table I.

Severe plasma leakage and dengue shock/ severe dengue

Severe dengue is defined by one or more of the following: (i) plasma leakage that may lead to shock (dengue shock) and/or fluid accumulation, with or without respiratory distress, and/or (ii) severe bleeding, and/or (iii) severe organ impairment. As vascular permeability progresses, hypovolaemia worsens and results in shock. It usually takes place around defervescence, usually on day 4 - 5 (range days 3–7) of illness, preceded by the warning signs. During the initial stage of shock, the compensatory mechanism which maintains a normal systolic blood pressure also produces tachycardia and peripheral vasoconstriction with reduced skin perfusion. From this point onwards, patients who do not receive prompt intravenous fluid therapy, progress rapidly to a state of shock. Dengue shock presents as a physiologic continuum, progressing from asymptomatic capillary leakage to compensated shock to hypotensive shock and ultimately to cardiac arrests. Tachycardia (without fever during defervescence), is an early cardiac response to hypovolaemia. During the initial stage of shock, the compensatory mechanism that maintains a normal systolic BP produces tachycardia with quiet tachypnoea (tachypnoea without increased effort)11, and peripheral vasoconstriction with reduced skin perfusion (manifested as cold extremities and delayed capillary refill time of > 2 seconds and weak volume peripheral pulses). As peripheral vascular resistance increases, the diastolic pressure rises towards the systolic pressure and the pulse pressure, the difference between the systolic and diastolic pressures narrows. The patient is considered to have compensated shock if the systolic pressure is maintained at the normal or slightly above normal range but the pulse pressure is ≤ 20 mmHg in children (e.g. 100/85 mmHg) or if they have signs of poor capillary perfusion. Compensated metabolic acidosis is observed when the pH is normal with low carbon dioxide tension and a low bicarbonate level.

Table 1. Medical complications seen in the febrile, critical and recovery phases of Dengue

1	Febrile phase Dehydration:	High fever may cause neurological disturbances and febrile seizures in young children
2	Critical phase Shock from plasma leakage:	Severe haemorrhage; organ impairment
3	Recovery phase	Hypervolaemia (only if intravenous fluid therapy has been excessive and/or has extended into this period) and acute pulmonary oedema

Worsening hypovolaemic shock:

It is manifested as increasing tachycardia and peripheral vasoconstriction. Not only the extremities cold and cyanosed but the limbs become mottled, cold and clammy. By this stage the breathing becomes more rapid and increases in depth – a compensation for the metabolic acidosis (Kussmaul's breathing). Finally, there is decompensation, both systolic and diastolic BPs disappear suddenly and dramatically and the patient is said to have hypotensive or decompensated shock. At this time the peripheral pulses disappear while the central pulse (femoral) will be weak. Hypotension develops when physiologic attempts to maintain systolic BP and perfusion are no longer effective. One key clinical sign of this deterioration is a change in mental state as brain perfusion declines. The patient becomes restless, confused and extremely lethargic. Seizures may occur and agitation may alternate with lethargy. On the other hand, children and young adults have been known to have a clear mental status even in profound shock. Adults have been known to be able to work until the stage of profound shock is reached. The failure of infants and children to recognize, focus or make eye contact with parents may be an early ominous sign of cortical hypoperfusion or failure to respond to painful stimuli such as venepuncture. Parents may be the first to recognize these signs – but they may be unable to describe them, other than to say something is wrong. Listen to parents! Hypotension is a late finding and signals an imminent total cardiorespiratory collapse. Hypotension is associated with prolonged shock which is often complicated by major bleeding[12] . Patients with severe dengue have varying degrees of coagulation abnormalities, but these are usually not sufficient to cause major bleeding[13,14]. When major bleeding does occur, it is almost always associated with profound shock since this, in combination with thrombocytopenia, hypoxia and acidosis, can lead to multiple organ failure and advanced disseminated intravascular coagulation.

Diagnosis:

The diagnostic method to confirm an acute infection depends on the time of clinical illness:

the febrile phase is coincident with the presence of viraemia which is detected by NS1antigen, some viral components and replication products in blood; the critical and convalescent phases coincide with the development of antibodies, IgG and IgM for dengue fever; Specific IgM is the best marker of a recent dengue infection.

Fluid management

The total amount of fluid recommended during the *entire critical phase* (48hrs in patients coming without shock and 24hrs in patients coming in shock) is:

Maintenance (M) + 5% of body weight

Maintenance (M) = 100ml/kg for the first 10kg +50ml/kg for next 10kg + 20ml/kg for balance weight. +5% of body weight (50ml x body weight in kg)

- The maximum weight for which fluid is calculated in any patient *should not exceed 50kg*. Accordingly, M+5% *should not exceed 4000 ml* any patient.

  In all patients entering the critical phase, normal saline or Hartmann solution should be given through an IV cannula in addition to oral fluid. Initial fluid requirement (oral + IV) is 1.5ml/kg/hr. Those who can drink well may be given IV fluids as 0.5ml/kg/hr. to 'keep vein open' and the balance as oral. In infants less than 6 months N/2 saline + 5% dextrose should be used. For those above 6 months when the patient is not taking orally for prolonged periods it is useful to give normal saline in 5% dextrose. Subsequent rate of infusion will depend on the rate of leakage (which will vary from patient to patient and even in the same patient from time to time) judged by pulse, BP, pulse pressure, capillary refill time, Hct and urine output.

  In patients who had been in the critical phase for a significant period but not gone into shock, the amount of fluid needed for maintenance could go up to 7ml/kg/hr. or more but would be unlikely to require the same amount for a long period as leaking will start slowing down. When pulse and BP are stable, it is important to bring down the rate of infusion to avoid fluid overload while repeatedly assessing the UOP, pulse and BP. If a higher rate of maintenance fluid is unable to maintain the pulse pressure, fluid boluses (N saline or colloids 10ml/kg/hr) should be used.

  The rate of IV fluid administration has to be adjusted *frequently* depending on vital signs especially pulse rate, BP, pulse pressure, Hct, CRFT and UOP. Calculate the UOP ml/kg/hr at each void.

  In a patient who is stable, hourly urine output (UOP) is the best guide to decide the rate of infusion. UOP of only 0.5-1ml/kg/hr. is sufficient to maintain renal functions during the critical period. UOP >1ml/kg/hr. suggests that infusion rates are too high. UOP <0.5ml/kg/hr. suggests inadequate fluids. In such

situations catheterisation may be required. Patients who are in shock due to plasma leakage usually have narrowing of pulse pressure ≤20mmHg and patients with bleeding usually present with hypotension. As the peak of leaking occurs around 24 hours, a patient who has gone into significant shock will be in a stage of leaking that has passed about 24 hours and will have only about a further 24 hours before the leaking stops. Hence, if a patient presents with shock (cold, clammy skin, pulse, BP un-recordable) one would assume that the patient had continued to leak before coming to hospital.

There are 2 main indications for colloids (dextran 40 and 6% starch):

- In the management of shock after 2 crystalloid boluses if the pulse/BP has not picked up.
- Development of shock when already having a fluid overload or the amount of fluid received over a period of time appears to be in the direction of exceeding M + 5% deficit.
- While in the critical phase if the patient deteriorates with no haemo-concentration (or if Hct drops) one has to suspect concealed bleeding. In that case bold transfusion is needed
- The end of the critical phase is indicated by stable vital signs, returning of Hct to normal along with clinical improvement and diuresis.
- Consider ABCS (acidosis, bleeding, calcium, sugar) when there is no improvement in spite of adequate fluid therapy.

If there is fluid overload, use packed red cells (PRC) at 5ml/kg once and repeat only if needed.

If there is no fluid overload use 10 ml/kg of whole blood (WB); 5ml/kg of PRBC or 10 ml/kg of whole blood to increases Hct by 5%. Prophylactic platelet transfusions are *not recommended*. Even with low platelet counts (<20 x 109/L) if there is no significant bleeding do not give platelets.

- Recombinant factor VII should be considered only in cases where the cause of bleeding is due to other reasons e.g. trauma.
- Using inotropes should be considered only if there is significant persistent hypotension after adequate resuscitation. IV frusemide is indicated during the recovery phase when there is a suggestion of pulmonary oedema or fluid overload. It is also indicated in patients passing less than 0.5ml/kg/hr of urine despite receiving adequate fluids and having stable BP, pulse, Hct to improve the UOP.[15]

Management of dengue encephalopathy

- Encephalopathy in dengue fever is usually of hepatic origin.
- Ensure adequate airway oxygenation with oxygen therapy. Intubation may be needed for those with respiratory failure or for those in semi-coma/coma.
- Reduction of intracranial pressure (ICP)
    - o Minimal IV fluid to maintain adequate intravascular volume. Ideally total IV fluid should not exceed 80% maintenance.
    - o Switch to colloids earlier if the patient continues to have a rising Hct and a large volume of IV is needed in cases with severe plasma leakage.
    - o Administer diuretic if indicated in cases with symptoms and signs of fluid overload.
    - o Keep in midline position with a tilt up at 15-30 degrees.
    - o Consider dexamethasone 0.5mg/kg/day IV every 6-8 hours to reduce ICP.
    - o Hyperventilation.
- Maintain blood sugar level >60mg/dl. Recommend glucose infusion rate between 4-6ml/kg/hr.
- Correct acid-base and electrolyte balance.
- Intravenous Vitamin K administration: 3mg for <1yr, 5mg for 1-5yrs, 10mg for >5yrs.
- Anticonvulsants (phenobarbitone, phenytoin and diazepam) should be given for control of seizures.
- When high liver enzymes indicate hepatic encephalopathy, other evidence for concealed bleeding should be looked for as it is one of the commonest causes of hepatic failure in DHF. Transfuse blood, preferably fresh packed red cells as indicated. Other blood components such as platelets, FFP may not be given because the fluid overload can cause increased ICP.
- Reduce ammonia production: Use lactulose, neomycin (may not be necessary if systemic antibiotics are given). Empirical antibiotic therapy may be indicated in case of suspected superimposed bacterial infections.

- H2 blockers or Proton pump inhibitors may be given to alleviate gastrointestinal bleeding.

Convalescent phase

This starts after the end of the critical phase and usually lasts 2-5 days. There will be reabsorption of extravasated fluid during this period. Indicators that the patient has reached the convalescent phase includes: Improved general wellbeing and return of appetite. Appearance of convalescent rash (typically appears as white patches in a red background) Generalized itching, hemodynamic stability, bradycardia or normal heart rate, diuresis, stabilization of Hct (Hct may even be lower than baseline due to interstitial fluid reabsorption) Rise of white cell count followed by rise of platelet count. Complications during convalescence include fluid overload, hypokalaemia and nosocomial infections. Hypokalaemia is treated with oral potassium supplements and fresh fruits. Rarely may need addition of potassium chloride to IV fluids.

Conclusion:

Recognize the beginning of the critical phase is very important. Predicting the rate of leak which vary from patient to patient and within the same patient from time to time, so matching the rate of transfusion and rate of leak is very important. Over-transfusion and under-transfusion both should be avoided during the critical phase of illness. Recognize the end of the critical phase is also vital in order to prevent fluid overload. Meticulous monitoring in both the dengue hemorrhagic fever and dengue shock syndrome is essential. Need for crystalloid to colloid and identification for the indications of blood transfusion key point for the management of dengue shock syndrome.

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Case Report

Congenital Chikungunya in Ad-Din NICU - A Case Report

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Abstract

Chikungunya virus is member Alpha virus genus, in Togaviridae family. Infected mosquitoes can spread the virus human to humans when they bite. Symptoms are fever, petechial or maculopapular rash and arthralgia or arthritis affecting multiple joints mainly in adults. This self-limiting illness resolve with time. The time of greatest risk of transmission from mother to fetus appears during birth if mother acquired the disease days before delivery. There are not many reports of confirmed chikungunya infection in newborns. Here we report a neonate infected with Chikungunya virus which was confirmed by ELISA test.

Introduction

Chikungunya is a relatively rare viral fever caused by an alphavirus that is spread by mosquito bites from the Aedes aegypti mosquito. Marion Robinson and W.H.R. Lumsden first described the disease in 1955, following an outbreak on the Makonde Plateau, along the border between Tanganyika and Mozambique, in 1952. Symptoms appear between 4 and 7 days after the patient has been bitten by the infected mosquito. High fever and headache with significant pains in the joints (ankles, wrists) and can persist for several weeks. There are not many reports of clinical features of confirmed chikungunya infection in newborns[1,2]. Neonates present at 3-5 days of life with fever, excessive crying, dermatological manifestations like maculo papular rash, nasal blotchy erythema, freckle like pigmentation over centrofacial area, vesiculobullous lesions, apnea, shock, disseminated intravascular coagulation (DIC). The time of greatest risk of transmission from mother to fetus appears during birth if mother acquired the disease days before delivery. Viral chikungunya perinatally transmitted leads to encephalitis in newborn[3-5]. Chikungunya is a self-limiting febrile illness and responded to supportive therapy. report a case of chikungunya infection in neonate is reported here which was confirmed by ELISA test and fully recovered with conservative management.

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Case study

B/O Moli, a 5 days old preterm appropriate for gestational age (AGA) baby girl admitted with N.Seizure, poor feeding, lethargy and fever for 2 days. Baby was born to a 28-year-old mother by elective lower segment cesarean section (LSCS). Antenatally, mother had high-grade fever and severe multiple joint pains 1 day before delivery and maternal antichikungunia IgM was positive. Mother continued to be symptomatic with severe arthralgia in the postnatal period as well and also developed diffuse hyper-pigmentation of body within 4 days of onset of symptoms. Immediate postnatal period was uneventful. On the 5th day of life, baby developed high-grade fever (103°F), seizure and was admitted in neonatal intensive care unit. After admission relevant investigations were sent and treatment was started with anticonvulsant, IVF and antibiotics as per protocol. On the 20th day, baby developed bi-pedal edema, tenderness, paradoxical cry and pigmentation around mouth and nose. Feed was

started by OG 5 ml 6 hourly which gradually increased as tolerated and subsequently changed to per oral feeds. Her initial CRP was 80 mg/L which is increased to 109 mg/L. Initial CBC show PC 21,000/cmm which is raised to 99,000/cmm. Her ICT for chikungunia IgM is +ve. Her ALT 2 U/L, S.Creatinine 1.1 mg/dl, PT initially 12 sec later 14 sec, FDP 400 ng/ml for which she was transfused FFP and platelet. Her S. Albumin was 21.8g/L for which She got albumin infusions. Her first USG of brain revealed cerebral edema which was treated accordingly.Gradually baby's clinical condition got improved.On detailed evaluation of history, similar clinical condition was reported to be present in the nearby areas and it was found that chikungunya was frequently diagnosed in that particular area. Mother was tested for chikungunya IgM and IgG, of which IgM was reported positive. However, the serology of the baby was reported positive. However, the diagnosis of congenital chikungunya was made based on the typical clinical manifestations in the mother and baby and on the strong epidemiological profile. With supportive management, the baby improved. However, the irritability and paradoxical cry persisted until the discharge of the baby. She was discharged after 3 weeks of intensive care stay and kept under follow-up.

Bullous dermatosis

Paradoxical cry, Pigmentation

Paradoxical cry

Discussion:

Chikungunya is an RNA virus belonging to the Alphavirus genus of Togaviridae family. It is transmitted to humans by mosquitoes of either the Aedes or Culex genus. The word chikungunya has been derived from a Makonde word meaning "that which bends up".Chikungunya was first described in Tanzania, Africa in 1952.

The incubation period can be 2-12 days, usually 3-7 days. It can cause a debilitating illness and symptoms mainly in adult include abrupt onset of fever, chills, headache, and severe joint pain with or without swelling (usually the smaller joints), low back pain, and rash. This reported case presented with fever, irritability, pigmentation, tender swelling of feet. Unlike dengue, hemorrhagic manifestation relatively rare and as a rule shock is not observed in chikungunya virus infection. Neonates present at 3-5 days of life with fever, excessive crying, dermatological manifestation like maculopapular rash, nasal blotchy erythema, freckle like pigmentation over centrofacial area, vesiculobullous lesions, apnea, shock, DIC. Neurological complicatio ns such as meningoencephalitis have been reported in patients during the first Indian outbreak as well as the recent French Reunion islands outbreaks [3-6].

Mother to child transmission of chikungunya virus was reported during the recent epidemic in dhaka. The time of greatest risk of transmission from mother to fetus appears during birth if mother acquired the disease days before delivery. Of the thirty three with viremia at the time of delivery, sixteen newborns were symptomatic in the neonatal period[7,8]. Robillard PY et al[9] also reported that transplacental transmission of chikungunya can also occur before 16 weeks and suggest that virus played a direct role in fetal deaths. Diagnosis is made by CHIK IgM and PCR. Most often chikungunya is a self-limiting febrile illness and responded to conservative or supportive therapy [3,9]. In Ad-din we receive 4 cases of suspected congenital chikungunia cases ,out of these our case is CHIK IgM +.

The neurocognitive outcome of infected children is poor and must be monitored throughout childhood to anticipate the psychomotor, cognitive and behavioral therapies. The neurocognitive outcome of children exposed to perinatal mother-to-child CHIKV infection is poor. Severe CHIKV neonatal encephalopathy is associated with an even poorer outcome. In conclusion, this case report shows that viral chikungunya can be transmitted from mother to babies and clinical presentation is similar to that of septicemia or meningitis.

Gradual improvment

Ready to discharge

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