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## Formative Assessment: Our Perspective

Sanjoy Kumar Chakraborty<sup>1\*</sup>

### ABSTRACT

There is no doubt that the present scenario of medical education of our country going down day by day. Because of rapid mushrooming of Non-Government medical organization, lack of desired infrastructure and competent man power, above all a sick competition between the different medical institutes (Both Government & Non Government) is one of the obstacle in the pathway of improving the quality of medical education now-a-days. Moreover, great confusion & unawareness regarding assessment technique make the pathway more uneven. There are two unique method of assessment technique we are commonly followed "Formative assessment" & "Summative assessment" method. Among them Formative assessment method is the most effectual tool to assess the student as well as the curricula. Unfortunately in our country in most of the cases this efficient tool were not used properly and found to be neglected due to ignorance & unwillingness. In this article detailed discussion on formative assessment will assist us to understand about the fact.

### What is Formative Assessment ?

Formative assessment is a range of formal and informal assessment procedures conducted by teachers during the learning process in order to modify teaching and learning activities to improve student attainment<sup>1</sup>. It typically involves qualitative feedback (Rather than scores) for both student and teacher that focuses on the details of content and performance<sup>2</sup>. It is commonly compared with summative assessment, which seeks to monitor educational outcomes, often for purposes of external accountability<sup>3</sup>.

### Background

Michael Scriven invented the terms formative and summative evaluation in 1967<sup>4</sup>. According to Scriven, formative evaluation gathered information to assess the effectiveness of a curriculum and guide the institute to choice which curriculum have to accept and how to improve it<sup>5</sup>. In 1968 Benjamin Bloom in the book "Learning for Mastery" consider formative assessment as a tool for improving the teaching-learning process for students<sup>6</sup>. In the "Handbook of Formative and Summative Evaluation" written by Benjamin Bloom in association with others, showed how formative assessments could be linked to instructional units in a variety of content area<sup>7</sup>. It is this approach that reflects the generally accepted meaning of the term today. For both Scriven and Bloom, an assessment, whatever its other uses, is only "formative" if it is used to alter subsequent educational decisions<sup>4</sup>. However, Black and William have proposed that, practice in a

classroom is formative to the extent that evidence about student achievement is provoked, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited<sup>8</sup>.

### Formative Assessment vs Summative Assessment

The type of assessment that people may be more familiar with is summative assessment. But there are gross differences between formative & summative assessment<sup>9</sup>. Summative assessment is an end course assessment method, whereas formative assessment is an in course assessment method. The Goal of the summative assessment is to take a decision but the goal of formative assessment is to improve learning & teaching method. Summative assessment method is sometimes normative (Comparing each student against all others) but sometimes criterion; on the other hand formative assessment method is always criterion (That means evaluating students according to the same criteria). Therefore, from the above discussion it is very clear that the objective and impact of the two assessment methods are completely different and their application should be emphasized clearly based on their objective.

### Importance of Formative Assessment

Formative assessment serves to create effective teaching curricula and classroom-specific evaluations<sup>10</sup>. By focusing on student-centered activities, a student is able to relate the material to his life and experiences. Students are encouraged to think critically and to develop analytical skills. This type of testing allows for a teacher's lesson plan to be clear, creative, and reflective of the curriculum<sup>11</sup>. The implications of this type of method, is developing a knowledgeable student with deep understanding of the information and then be able to account for a students' comprehension on a subject.

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In the UK education system, formative assessment has been a key aspect of the agenda for personalized learning. The UK government has stated that "personalized learning depends on teachers knowing the strengths and weaknesses of individual learners, and that a key means of achieving this is through formative assessment, involving high quality feedback to learners included within every teaching session"<sup>12</sup>.

#### Benefit for the Students<sup>13</sup>

- i) Students are more aware & motivated to learn
- ii) Students take responsibility for their own learning
- iii) Students learn valuable lifelong skills such as self-evaluation, self-assessment, and goal setting
- iv) Students become more skilled at self-assessment.

#### Benefit for the Teachers<sup>14</sup>

- i) Teachers are able to determine what standards students already know and to what degree.
- ii) Teachers can decide what minor modifications or major changes in instruction they need to make so that all students can succeed in upcoming instruction and on subsequent assessments.
- iii) Teachers can create appropriate lessons and activities for groups of learners or individual students.
- iv) Teachers can inform students about their current progress in order to help them set goals for improvement.

#### Conclusion

Institutional quality of education mostly depends on formative assessment not on summative assessment. If we want to improve the quality of medical education of our country by 2023 we have to devote ourselves to improve the quality of medical education at the institutional level. Therefore, it may be the demand of time to re-evaluate present curriculum & assessment standard to give more emphasis on formative assessment dedicatedly & honestly to improve the quality of medical education; otherwise, the hope of our health care system will be ruined into darkness in near future.

#### Disclosure

The author declared no competing interests.

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## Feto-maternal Outcome in Preeclampsia : A Study Done in Tertiary Hospital in Bangladesh

Shahanaj Sharmin<sup>1\*</sup> Didarul Alam<sup>2</sup> Shirin Akter Khanam<sup>3</sup> Farzana Rahman<sup>4</sup>  
Sraboni Barua<sup>5</sup> Pranoy Kumar Majumdher<sup>6</sup>

### ABSTRACT

**Background :** Aims of this study was to find out the feto-maternal outcome in preeclampsia. **Methods:** A prospective case control study was conducted in Obstetrics and Gynaecology Department, Bangabandhu Memorial Hospital (BBMH) USTC Chittagong from July 2013 - June 2014. **Results:** Study included 150 pregnant women of which 50 were case group (Pregnancies complicated by preeclampsia) and another 100 were control group (normal uncomplicated pregnancy). Both the maternal and fetal outcomes were observed and recorded. Mean age of the case group were 24.58±4.05 years and mean age of control group were 23.92±3.72 years. Mean gestational age during delivery for the case and control group were 39.02±1.6 and 39.58±0.8 weeks respectively and the difference in between two groups were statistically significant ( $p < 0.030$ ). One minute APGAR score was (8-10)48%, 6-7(44%) and (<6) 8% in case group. On the other hand in control group (8-10)85%, (6-7)15% and the difference was highly significant ( $p = 0.000$ ). Among the case group maternal complications were found in 18% cases like renal failure, DIC (Disseminated intravascular coagulation) abruptio placenta, HELLP syndrome and Eclampsia. In control group no complications were found. On the other hand, perinatal complications like prematurity, birth asphyxia, low birth weight and perinatal death in case group 26% and control group 7%. These were statistically highly significant difference ( $p = 0.001$ ). **Conclusion:** Preeclampsia contributes to the high mortality and morbidity of both mothers and neonates in our country. So proper antenatal care must be provided to prevent preeclampsia and timely intervention, early resuscitation with good neonatal care can improve fetomaternal outcome.

**Key words:** Preeclampsia; Maternal outcome; Perinatal outcome; Birth weight; APGAR score.

### Introduction

Preeclampsia is a disease which causes significant maternal and perinatal morbidity and mortality, especially in the developing countries<sup>1</sup>. It is a complicated, multiorgan disease occurring in upto 6-8% of pregnancies typically after 20 weeks of gestation in previously normotensive women<sup>2,3</sup>. The etiology of this disease is not known and therefore effective primary prevention of the disease is still not possible<sup>3</sup>. The incidence of the disease is high and present late with complications in most developing countries. Lack of antenatal screening test to identify the risk of women may be

contributing to this<sup>4</sup>. There was no concrete data found on incidence of preeclampsia in our country but according to annual departmental Statistics of 2013 in BBMH, USTC the prevalence was 6.43%. According to severity, most of the cases are mild preeclampsia comprises 90% which occur after 34 weeks gestation<sup>5,6</sup>. It can manifest as a maternal disorder only, with an appropriate fetal growth, or it can present itself with a growth restricted fetus<sup>7</sup>. In developing countries approximately 10-15% of maternal deaths are associated with preeclampsia leading to Eclampsia<sup>8</sup>. In South East Asia, Bangladesh, the most densely populated country has high maternal mortality as well as fetal mortality rate. According to Bangladesh Demographic and health survey 2015, the Maternal Mortality Rate (MMR) is 1.7 per 1000 live births and Neonatal Mortality Rate (NMR) is 23.3 per 1000 live births<sup>9</sup>. If preeclampsia is treated early and effectively, feto-maternal mortality and morbidity can be reduced significantly. The most common causes of maternal mortality and morbidity are related to eclampsia, abruptio placentae, pulmonary edema, stroke, hepatic or renal failure, HELLP [Hemolysis, elevated liver enzymes, low platelet count, myocardial infarction, Disseminated Intravascular Coagulation (DIC) and cerebral haemorrhage]<sup>10,11</sup>. Women who receive no prenatal care are 12 times as likely to die from preeclampsia complications as women who do receive prenatal care<sup>12</sup>. Preeclampsia is a major cause of stillbirth and neonatal death. Intrauterine Growth Restriction (IUGR)

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Low Birth Weight (LBW) prematurity & neonatal asphyxia are the other consequences. In Eclampsia, though a number of patients delivered a healthy baby with good outcome, but perinatal mortality is high which comprises 30-50 percent<sup>13</sup>. The present study was aimed to assess the fetomaternal outcome of preeclampsia patients to share our experience in a tertiary care centre.

**Materials and methods**

This was a prospective case control study carried out in the Department of Obstetrics & Gynecology, BBMH, USTC, Chittagong during July 2013 to June 2014. This study enrolled 150 women in between 32 weeks to term (100 normotensive as control group and 50 preeclamptic as case group). Using predesigned questioner, information were recorded. Relevant informations were collected from antenatal records, interviewing patients, observation and follow up during hospital stay. Data of fetomaternal outcome were collected from the delivery notes also.

**Inclusion criteria**

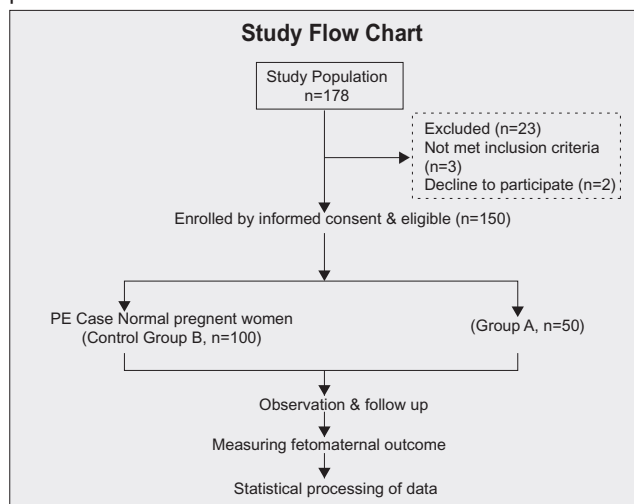
The control group were selected with normal blood pressure throughout the pregnancy having no proteinuria. Case group were :

- i) Blood pressure 140/90 mm of Hg or more taken on two occasions 6 hours apart after the gestational age of 32 weeks
- ii) Proteinuria.

**Exclusion criteria**

- i) Chronic hypertension (Hypertension before current pregnancy)
- ii) Eclampsia
- iii) Gestational hypertension
- iv) Placenta praevia
- v) Presence of diabetes mellitus
- vi) Rh negative mother.

All cases and control group enrolled in the study were explained about the nature and purpose of the study, and only those who gave written informed consent included in the study. Statistical analysis were carried out after compiling data & level of significance was considered when p value was <0.05.



**Results**

The mean age was 24.58 ± 4.05 years and 23.92 ± 3.72 years in case and control group respectively. No difference were found in age of mothers in between two groups. The mean gestational age at delivery was significantly high (p<0.05) in case group (39.02±1.61 weeks) compared to control (39.56±0.87 weeks) shown in table I.

Regarding mode of delivery, 31(62%) women underwent cesarean section in case group whereas in control group 44% that was significant in case group (p=0.038) which was shown in table II. The mean birth weight of the neonates was 2.52±0.42kg and 2.88±0.29kg in case and control group respectively. The mean difference between the two groups were highly significant (p=0.000) shown in Table I. The mean APGAR score of the neonate at one minute was 7.9 ± 0.95 and 9 ± 0.82 in case and control group respectively. Statistical analysis between the two groups was highly significant as p<0.000 (Figure 1).

Maternal complications among the case group was 18% and 0% in control group. The difference between the two groups are highly significant (p=0.000). On the other hand perinatal complications was highly significant (p=0.001<sup>HS</sup>) in case group (26%) compared to control group (13.3%) shown in table III.

**Table I :** Characteristics of the women enrolled in the study (n-150)

Variables	Case (n=50)	Control (n=100)	p value
Age (Years)	24.58 ± 4.05	23.92 ± 3.72	0.322 <sup>NS</sup>
Systolic blood pressure (mm Hg)			
Mean ± SD	148 ± 12.35	122.15 ± 6.44	0.000 <sup>HS</sup>
Range	130 -200mm Hg	105 -130mm Hg	
Diastolic blood pressure (mm Hg)			
Mean ± SD	100 ± 9.74	74.05 ± 5.97	0.000 <sup>HS</sup>
Range	90 -120	60 -80	
Gestational age at delivery (Wks)	39.02 ± 1.61	39.56 ± 0.87	0.030 <sup>S</sup>
Weight of Newborn (Kg)	2.52 ± 0.42	2.88 ± 0.29	0.000 <sup>HS</sup>

**Table II :** Mode of delivery

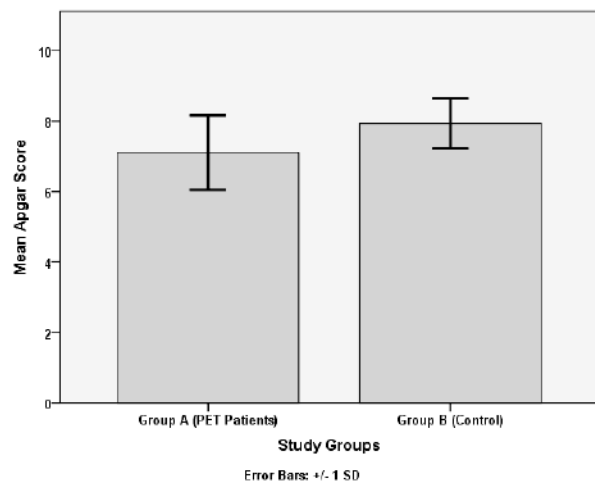
Mode of delivery	Case group (n=50)	Control group (n=100)	χ <sup>2</sup> test significance
Caesarean section	62%	44%	p=0.038 <sup>S</sup>
Vaginal delivery	38%	56%	

**Table III :** Distribution of fetomaternal complications among the study groups

Feto-maternal complications	Case group	Control group	$\chi^2$ test significance
Pregnancy Complications Present	18%	0.0%	p =0.000 <sup>HS</sup>
Pregnancy Complications Absent	82%	100%	
Perinatal Complications Present	26%	7%	p=0.001 <sup>HS</sup>
Perinatal Complications Absent	74%	93%	

Pregnancy complications	Frequency	Percentage (%)
IUGR	05%	3.3%
Renal Failure	02%	1.3%
DIC	01%	0.7%
Abruptio placenta	01%	0.7%
HELLP syndrome	01%	0.7%
Eclampsia	01%	0.7%
Perinatal complications		
Neontal ICU Admission	14%	9.3%
Prematurity	13%	8.7%
Birth asphyxia	07%	4.7%
Low birth weight	04%	2.7%
Perinatal death	02%	1.3%

IUGR: Intrauterine Growth Restriction, DIC: Disseminated Intravascular Coagulation, ICU: Intensive Care Unit.



**Figure 1 :** Mean apgar score

**Discussion**

Hypertensive disorders of pregnancy is considered a major health problem which carries high risk of feto-maternal mortality and morbidity<sup>14</sup>.

Although PE is usually diagnosed in late pregnancy, the root of the disease is present in the first half of pregnancy. Mean age of the preeclampsia patients were 24.58±4.05 years, range 20-30 years. Mean age of normotensive pregnant women (Control group) was 23.92±3.72 years, range

17-34 years. Most of the women were between 20 -30 years which is consistent with findings by suxena et al and yadab et al<sup>15,16</sup>. However in contrast to our findings, saha et al reported maternal age is significantly higher in pregnancy induced hypertension<sup>17</sup>. Results in our study might be due to larger number of younger age group of pregnant patients as girls in our country get married at an earlier age.

Present study showed that mean gestational age at delivery for the case group was 39.02±1.61 weeks and 39.56±0.87 weeks in control group. Preeclampsic patients delivered at a significantly shorter gestational age (t=2.216, p=0.030). Similar results have also been observed by kishwras et al and samira BG et al<sup>18,19</sup>. Other researchers have also demonstrated the findings almost nearer to present findings focusing reliability of the study.

We also observed that 31 out of 50(62%) patients of preeclampsia were delivered by Lower Segment Caesarean Section (LSCS) where as in normotensive group 44 out of 100(44%) patients were delivered by lower segment caesarean section. Similarly increased caesarean rates were reported in some studies<sup>20,21</sup>. In contrast to our results, Tavassli et al have reported that severe preeclampsia was not associated with increased caesarean rates<sup>22</sup>. Vaginal delivery may be feasible in the absence of emergency obstetric indications for caesarean section. This difference in LSCS rate may be due to difference in medical facilities and quality of Antenatal Care (ANC) in different parts of the world. Yucesoy et al have reported that IUGR, low APGAR scores and fetal death during labour were significantly more frequent in preeclampsic group<sup>23</sup>.

In our study 7% pregnancy was complicated in case group and in control group no significant complication was found. Among them 3.3% IUGR, 1.3% renal failure, 0.7% abruptio placenta, 0.7% HELLP and 0.7% eclampsia. Similar results have also been observed by Murphy and stirrat<sup>24</sup>.

Present study showed that mean birth weight in case group was 2.52 ± 0.42 kg and in control group was 2.88±0.29 kg. The difference was statistically highly significant (p<0.000). Similar results have also been observed by Luis et al and Kishwaras et al<sup>18,24</sup>. Mayhew et al who studied placental morphology in pregnancy complicated by preeclampsia that fetal weights were reduced in all complicated pregnancy but only intrauterine growth restriction was accompanied by a significantly smaller placenta<sup>25</sup>. The present study showed perinatal complication in case group 26% and control group 7% which was statistically highly significant (p=0.001). Among them 18% baby needed NICU care in case group and 5% in control group.

Birth asphyxia and perinatal mortality in case group 3.6% and 0.3% respectively. On the other hand in control group 1.1% and 0% respectively. Similar results were also observed by singhal et al<sup>21</sup>.

**Conclusion**

Significant mortality and morbidity were observed in both mothers and neonates due to pre-eclampsia especially in developing countries. Since it cannot be completely prevented, timely diagnosis of high risk patients and prompt treatment in mild stage is the key to prevent complication. Only quality obstetric care can reduce the adverse outcomes of preeclampsia. This study therefor advocates more research in to the prevention, prediction and management including neonatal care of PE.

**Disclosure**

All the authors declared no competing interests.

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# Knowledge and Practice About Personal Hygiene Among the Students of the Secondary School at Dohazari Union of Chandanaish Upazila

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## ABSTRACT

**Background:** Good personal hygiene now forms part of primary health prevention strategy by reducing morbidity and mortality in children. The global burden of disease and mortality rates could be reduced by about 9.1% and 6.3% respectively by good personal hygiene. Children who learnt what it is and how to follow appropriate hygiene practices will usual hold that into maturity. WINSLOV in 1920 observed that personal hygiene can be improved by educating individuals in communities on basic tips of achieving personal cleanliness through their organized efforts. Hence personal hygiene is a public health tool that is used for disease prevention & health promotion in individuals, families & communities. **Methods:** Descriptive cross sectional study was performed Jamirjuri Girls High School at Dohazari Union of Chandanaish Upazila Chattogram from 31st October 2017 to 17th November 2017. Data collected on 6th November 2017. Population were female students above the age of 11. Data was collected by face to face interview method. In non Probability convenience type of sampling from 270 respondents with a Prepared mixed type of questionnaire. **Results:** Out of 270 respondents, 92.9% respondents use soap for hand washing before meal, 83.78% respondents brushing their teeth with paste, Our study result showed that 98.89% respondents used to drinking water from tube well, 78.52% respondents learning about cleanliness from parents & 20% from school. Acute Gastro-Enteritis (AGE) 83.70%, Acute Respiratory Infection (ARI) 70.37%, Common Cold 80%, Otitis Media 35.93%, Skin Infection 41.31%, Dental Carries 34.44%, Helminthiasis 72.6% related to personal unhygienic condition. **Conclusion:** It was revealed in the study that diseases among the children of secondary school due to personal unhygienic was a common occurrence & they were categorized mostly So to bring the disease rate due to, personal unhygienic among the secondary school student at zero point. More idea can be developed by raising students awareness. Awareness & knowledge about diseases related to personal hygiene can also be increased through proper health education program.

**Key words :** Personal hygiene; Health prevention; Water supply; Sanitary latrine; Hand washing; Hair washing; Brushing practice.

## Introduction

Personal hygiene involves those practices which are performed by an individual to care for ones bodily health and well-being through cleanliness which is important in every stage of life. It generally includes cleanliness of the body & proper maintenance of personal appearance. Hence personal hygiene serves two main objectives- It keeps the person healthy & prevents spreading the disease and helps in keeping good mentality by feeling good in concern to self and body.

According to the World Health Organization (WHO) fundamental Hygiene behavior such as washing hands, removing stool safely and using clean water are beneficial for

improving help<sup>1</sup>. Children with proper hand washing practices are less likely to report gastrointestinal and respiratory symptoms<sup>2</sup>. Hand washing with soap has been reported to reduce diarrheal morbidity by 45% & respiratory infections by 23%<sup>3</sup>. Oral health knowledge is considered to be an essential prerequisite for health related practices<sup>4</sup>. Improper tooth brushing among the child age group are the main cause of developing dental disease in rural or urban area<sup>5</sup>. In addition to the provision of safe community water supply & sanitation services there is a need for education on hygiene<sup>6</sup>. Good personal hygiene now forms part of primary health prevention strategy by reducing morbidity and mortality in children<sup>7</sup>. The global burden of disease and mortality rates could be reduced by about 9.1% and 6.3% respectively by good personal hygiene<sup>8</sup>. Children who learnt what it is and how to follow appropriate hygiene practices will usual hold that into maturity<sup>9</sup>. WINSLOV in 1920 observed that personal hygiene can be improved by educating individuals in communities on basic tips of achieving personal cleanliness through their organized efforts<sup>10</sup>. Hence personal hygiene is a public health tool that is used for disease prevention & health promotion in individuals, families & communities.

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**Materials and methods**

Descriptive cross sectional study was performed Jamirjuri Girls High School in Dohazari Union of Chandanaish Upazila Chattogram from 31<sup>st</sup> October 2017 to 17<sup>th</sup> November 2017. Data collected on 6<sup>th</sup> November 2017. Population were female students above the age of 11. Data was collected by face to face interview method. In non Probability convenience type of sampling from 270 respondents with a Prepared mixed type of questionnaire. After establishing a rapport, our aims and objectives were told to the respondents. Then oral consent was taken from them before data collection. After collection of data, Data was edited, organized, compiled and analyzed manually with the help of calculator.

**Results**

**Table I :** Distribution of respondents by age

Age (Years)	Number of respondents	Percentage (%)
11-12	92	34.07
13-14	125	46.3
15-16	53	19.63
Total	270	100

The above table showed that, the majority of the respondents 125 (46.3%) were in age group of 13-14 years, followed by 92 (34.07%) were in age group of 11-12 years. Only 53 (19.63%) respondents were in age group of 15-16 years.

**Table II :** Distribution of respondents by class

Class	Number of respondents	Percentage (%)
Six	103	38.15
Seven	102	37.78
Eight	0	0
Nine	59	21.85
Ten	5	1.85
Total	270	100

The above table showed that the majority of the respondents 103 (38.15%) were in class six, followed by 102 (37.78%) were in class seven, 59 (21.85%) were in class nine. Only 5 (1.85%) were in class ten.

**Table III :** Distribution of respondents by source of learning about cleanliness

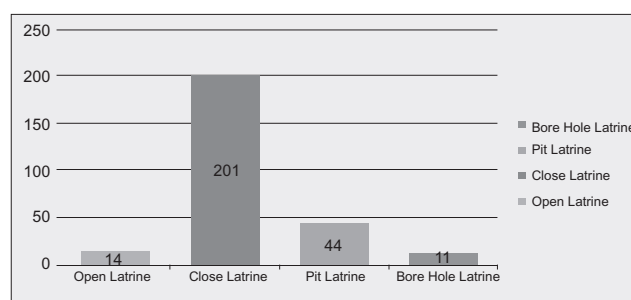
Learn about cleanliness from	Number of the respondents	Percentage (%)
Parents	212	78.52
School teacher	54	20
Books	4	1.48
Radio	0	0
Television	0	0
Poster	0	0
Total	270	100

The above table showed that the majority of the respondents 212 (78.52%) learned about cleanliness from parents, followed by 54 (20%) from school teachers. Only 4 (1.48%) respondents learned about cleanliness from books.

**Table IV :** Distribution of respondents by using materials for washing hands

Materials for washing Hands	Number of respondents	Percentage (%)
Soap and water	251	92.9
Ash and water	1	0.37
Mud and water	0	0
Only water	14	2.59
Antimicrobial agent	4	1.48
Total	270	100

The above table showed that the majority of the respondents 251 (92.9%) use soap and water for washing hands, followed by 14 (2.59%) respondents use only water, 4 (1.48%) respondents use antimicrobial agents for washing hands. Only 1 (0.37%) respondent uses ash and water for washing hands.



**Figure 1 :** Distribution of respondents by type of latrine used in home

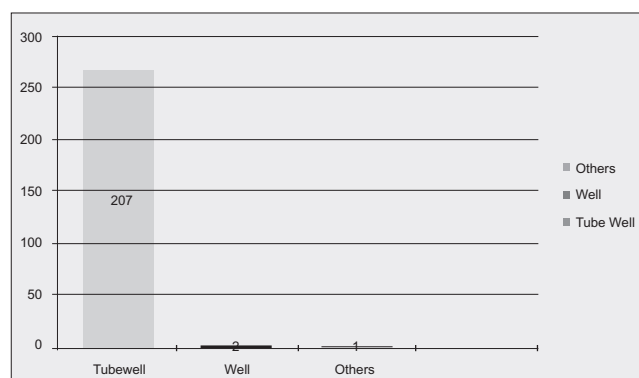
Bar diagram showing on account of types of latrine used in home. The major proportion of respondents 201 (74.44%) use close latrine in home, Followed by 44 (16.3%) respondents use pit latrine. Only 11 (4.07%) respondents use bore-hole latrine.

**Table V :** Distribution of respondent by occurrence of disease

Disease Occurrence	Number of respondents	Percentage (%)
A.G.E	226	83.70
A.R.I	190	70.37
Common cold	216	80
Otitis media	97	35.93
Skin infection	111	41.11
Dental carries	93	34.44
Helminthiasis	142	72.6



The above table showed that the majority of the respondents 226 (83.70%) has the disease group of A.G.E. Followed by common cold 216 (80%), Helminthiasis 142 (72.6), Skin infection 111 (41.11%), Otitis media 97 (35.93%), Dental carries 93 (34.44%).



**Figure 2 :** Bar diagram showing distribution of respondents by types of water source for drinking purpose.

Bar diagram showing on account of types of water source they take for drinking purpose. The major proportion of respondents 267 (98.89%) take tube well water for drinking purpose, Followed by 2 (0.74%) respondents take water from wells. Only 1 (0.37%) respondent takes water from other sources.

**Discussion**

A descriptive cross sectional type of study was conducted on knowledge and practice of personal hygiene among the secondary school children from 30 October to 16 November in Dohazari Union, Chattogram. The objective of the study was to determine knowledge and practice related to personal hygiene among the secondary school.

A study on similar background was conducted by Shayel Farah, Meherunnessa Begum, Nasreen Akther, Mohoshina Karim and Nadia Begum-Delta Medical College institute of Bangladesh<sup>11</sup>.

Out of 270 respondents, 92.9% respondents use soap for hand washing before meal, but in their study, this number was 67%.

Our study result showed that 83.78% respondents brushing their teeth with paste, but in their study this number was 50%.

Our study result showed that 98.89% respondents used to drink water from tube well, but in their study, this number was 60%.

Traits	Study from the slum of Dhaka city (475 respondents)	Our study
Use soap for hand washing before meal	67%	92.9%
Brushing teeth with past	50%	83.78%
Use to drink water from tube well	60%	98.89%

Another study on similar background was conducted by Khondker Saifimtiyaz, Khadiza Begum, Nilufar Begum, Samiha Naureen, Jony Barua, Zobaer Faruque and Abdur Rahman Khalid – Northern International Medical College, Institute of Bangladesh<sup>12</sup>.

Out of 270 respondents, 92.9% respondents use soap for hand washing before meal but in their study this number was 82%.

Our study result showed that 98.89% respondents used to drink water from tube well, but in their study this number was 90.67%.

Our study result showed that 78.52% respondents learning about cleanliness from parents & 20% from school teacher, but in their study this number was 60% from parents & 40% from school teacher.

Our study result showed that 83.78% respondents brushing their teeth with past, but in their study this number was 70%.

Traits	Study from rural community of Gazipur (384 respondents)	Our study (270 respondents)
Use soap for hand washing before meal	82%	92.9%
Use to drink water from tube well	90.67%	98.89%
Learning about cleanliness	Parents – 60% School teacher- 40%	Parents- 78.52% School teacher- 20%
Brushing teeth with paste	70%	98.89%

Another study on similar background was conducted by Mohammed Ghnim, Nihar Das, Dashayer Abdullah, Hibalssa, Rasha Albarazi, Zaidal-Al-Saheli Department of Community and Family Medicine of College of Medicine University of Sharjah, UAE<sup>13</sup>.

Out of 270 respondents, 92.9% respondents use soap for hand washing before meal but in their study, this number was 71%.

Our study result showed that 83.78% respondents brushing their teeth with past, but in their study this number was 71%.

Our study result showed that 78.52% respondents learning about cleanliness from parents & 20% from school teacher, but in their study this number was 50% from parents & 50% from school teacher.

Traits	Study of secondary school student in Sharjah-UAE (1000 respondents)	Our study (270 respondents)
Use soap for hand washing before meal	71%	92.9%
Brushing teeth with paste	71%	83.78%
Learning about cleanliness	Parents- 50% School teacher-50%	Parents- 78.52% School teacher-20%

It has been observed that there is no major difference between the studies is given in above % our study.

### Conclusion

The survey was completed successfully. In this survey we tried to assess the knowledge of personal hygiene among the students of secondary school children & their health seeking behavior in Dohazari Jamirjuri Girls High School in Dohazari Union in Chandanaish Upazila. Also from the survey we have gathered experience & practical knowledge about the field application of academic study. It was revealed in the study that diseases among the children of secondary school due to personal unhygienic was a common occurrence & they were categorized mostly unhygienic was a common occurrence & they were categorized mostly Acute Gastro-Enteritis (AGE) 83.70%, Acute Respiratory Infection (ARI) 70.37%, Common Cold 80%, Otitis Media 35.93%, Skin Infection 41.31%, Dental Caries 34.44%, Helminthiasis 72.6%. So to bring the disease rate due to, personal unhygienic among the secondary school student at zero point. More idea can be developed by raising students awareness. Awareness & knowledge about diseases related to personal hygiene can also be increased through proper health education program.

### Disclosure

All the authors declared no competing interests.

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## The Alarming Rise of Sexual Assault Cases in Our Society: One Stop Crisis Centre Support Rape Victims in Sylhet, Bangladesh

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### ABSTRACT

**Background:** Rape and violence against women are a massive problems Bangladesh. Rape victims come by two ways for medico legal examination. Firstly after rape they file a case in police station. Then court orders the police to take the victim in government medical college for examination. Secondly victim directly admitted in One Stop Crisis Center (OCC) where they get primary treatment, shelter, police support and legal assistance. OCC arrange for their medical examination. This study tried to evaluate the different aspects of profile of victims of rape cases also how OCC helps them in Sylhet district of Bangladesh. **Methods:** Total 120 rape victims were admitted that period to OCC and Forensic Medicine Department, Sylhet Osmani Medical College, Bangladesh from July 31, 2017 to December 31, 2017. **Results:** Among the study majority (78.2%) of rape victim's age below 20 years. Maximum range 60 and minimum below 5years. Most of the incidents (71.20%) taken in victims houses and nearby alone places, majority incident happened in evening and night. The study also revealed that more than one-third (36%) the accused were known to the victims and the remaining were unknown. **Conclusion:** OCC helps them from primary treatment till legal assistance. So it's time to create Public awareness against rape, which help the victim to produce effective report due to complain also preserving the evidences of crime and also modern techniques like DNA diagnosis may be help to identify the offender.

**Key words:** Sexual offence; Rape; OCC report; Victim; Accused.

### Introduction

In Bangladesh rape is a common incident. Everyday this incident happened. Some flashes in newspaper, others remain silent. It is one of the silent sexual crimes against women and girls. Many women never report the rapes. In Bangladesh, police statistics on cases registered on Violence Against Women (VAW) show that rape is the second most commonly reported form of violence against women, following dowry related harassment<sup>1</sup>. The victim or family members of the victim remain silent due to the lack of support services or provision of protection for victims and witnesses, social stigma associated with rape and prevailing patriarchal attitudes, protracted court proceedings, inadequate investigations by the police, lacunae in the law, particularly the absence of rape shield

provisions, etc. Moreover the rape victim has to undergo severe mental and social constraints<sup>2,3</sup>. According to section 375 (Act 1860) of Bangladesh Penal Code a man is said to commit 'rape' who except in the case hereinafter excepted, has sexual intercourse with a woman under circumstances falling under any of the five following descriptions-a man is said to commit "rape" who except in the case hereinafter excepted, has sexual intercourse with a woman under circumstances falling under any of the five following descriptions<sup>4</sup>.

- i) Against her will
- ii) Without her consent
- iii) With her consent, when her consent has been obtained by putting her in fear of death, or of hurt
- iv) With her consent, when the man knows that he is not her husband, and that her consent is given because she believes that he is another man to whom she is or believes herself to be lawfully married
- v) With or without her consent, when she is under fourteen years of age.

No age is safe from rape, as children of one year or less and old woman of 85 years have been reported<sup>5</sup>. From January 2014 to December 2017, a total of 17,289 cases of women and child rape were recorded throughout the country. The total number of victims in those cases was 17,389, of which 13,861 were women and 3,528 children<sup>6</sup>. According to Ain O Salish Kendra (ASK) report, In Bangladesh sexual assault and incidents of violence against

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women were higher in 2017 than last year. A total of 818 women were raped across the country, among which 47 were killed after rape and 11 committed suicide. In 2016, a total of 659 women were raped, according to the report<sup>7</sup>. According to American Medical Association rape is considered the most under reported violent crime in USA<sup>8</sup>. A Government report (2007) says that 75 and 95 percent of rape crimes are never reported to the police in UK<sup>9</sup>. After rape, victims don't know what to do? A village girl or women have no idea, how to procedure a police file? At first they manifested from social stigma, phobia, humiliation, and mental etc which they can't overcome. At last they don't report any file against offender. From such view, OCC provide all required services for rape victim in one place. In every district Government Medical College OCC is situated near the emergency department of hospital. The aim of the study was to determine, how OCC help & support rape victims also find out the scenario of rape victims of Bangladesh and with the ultimate aim to create public awareness about the brutal crime (Rape).

#### Materials and methods

The study was carried out in the One-stop Crisis Centre (OCC) of Sylhet Osmani Medical College Hospital (SOMC) Bangladesh, during the period from July 31, 2017 to December 31, 2017. 120 victims reported from eleven thanas in OCC were selected as cases for the study. Relevant documents were collected from the preserved copies of the reports in the forensic department. Data were compiled and expressed as proportions and also take precautions to ensure privacy and safety of the respondents, and made sure that no third person was present while a respondent attended the survey. Written informed consent was taken and purpose of the study was not disclosed to her.

#### Results

Only the victims of rape case were brought for medico legal examination. No accused were brought for examination. Some of the accused escape arrest and the others were under the police custody. Within 120 victims females 75(62.5%) comes from courts & remaining 45( 37.5%) admitted directly to OCC. One third ( $1/3$ ) comes medical immediately after incident and remaining  $2/3$  comes later day. The time elapsed between the incidence and the date of examination of the victims varied from one day to 204 days. From our observations, it was found that the age of victims ranged from a five year old child to sixty years old women. Majority victims (72%) are lower economic class & 23% middle class and 5% higher class. 82% comes from rural area & remaining 18% from urban. whole. About 68% suffer simple injury like, abrasion, bruise etc. and 12% severe injury like perineum rupture, etc and remaining 20% manifestation rape trauma syndrome. OCC gives initial treatment for whole. Not also primary health services but also police assistance, DNA test, social services, legal assistance, psychological counselling and shelter service

etc.  $2/3$  victims are unmarried &  $1/3$  married. The place of incidence of offences was highest (74.2%) in the victim's houses and nearby fields. No positive finding in favour of sexual intercourse was found in maximum (72.4%) of cases.

**1) Admission:** Total 120 victims came for medicolegal examination. Within 75(62.5%) females comes from courts with police escort & remaining 45(37.5%) admitted directly to OCC (Table I).

**Table I :** Number of admission victims

Total	Sylhet Osmani Medical College Hospital (SOMC)	OCC (One-stop Crisis Centre)
120	75(62.5%)	45( 37.5%)

**2) Age group :** From our observations, it was found that the age of victims ranged from one year old child to sixty years old women. The most affected age group of victims was 13-20 years in 67 (55.83%) cases followed by 21-40 years in 44 (36.66%) cases. Also in 4 (3.33%) cases victims were between 0 to 10 years of age followed by 2 (1.66%) cases the victims were between 51 to 60 years of age (Table II).

Among the total sample, most of them (77.4%) were unmarried and only (22.85%) were married.

**Table II :** Distribution of victims according to age group

Age group (In years)	Frequency	Percentage (%)
01-10	4	1.66%
11-20	67	55.83%
21-30	25	20.8%
31-40	19	15.8 %
41-50	3	2.5%
51-60	2	1.66%
Total	120	100%

**3) Occupation and marital status:** Majority girls are lower poor class, works in other house, also garment and students. They were abducted and raped. Also house wives, divorcee, widows women's were present (Table III).

**Table III :** Distribution of victim's profession

Occupation	Frequency	Percentage (%)
Student	35	29.1%
Garment / House worker	41	34.1%
Housewife/Divorcee	13	10.8%
Widow	10	8.3%
No occupation / Unemployed	11	9.1%
Labour	08	6.6%
Child	02	1.6 %



**4) OCC support the victims:** 45 (37.5%) admitted, within them 45 (100%) get primary health services, police assistance 17(37.7%) DNA test 05 (11.1%) legal assistance 32 (71.1%), psychological counseling 07 (15.5%) who are suffering from rape trauma syndrome (Table IV).

**Table IV :** OCC services victims

OCC support	Frequency	Percentage (%)
Health care	45	100%
Police assistance	17	37.7%
DNA test	05	11.1%
Legal assistance	32	71.1%
Psychological counseling	07	15.5%

### Discussion

Rape is among the highest forms of crime experienced by women in all sectors of the society. It is one of the cognizable offences and profile of its motives varies from case to case. The main motive is sexual gratification of the accused. No age is safe for rape from 1 to above 60 years. In this study majority of the victims of alleged rape cases were below 20 years who were girl and young women. Similar findings were observed by Sarker et al and Hossain et al where they reported that most of the victims were young, below the age of 20 years<sup>10,11</sup>.

In this study majority victims girls are lower poor class, works in other house, also garment and students. Young girls working in the garments factories when return home at night after their overtime duties were abducted and raped. Majority incidents take place Victims' houses and near by places also some other distance and maximum incident happened in evening and night. One-third (36%) the accused were known to the victims and the remaining were unknown.

The study found that only 14.2% alleged rape cases reported within 24 hours for medical examination, whereas the remainders reported after 24 hours of the offence, which ranged from within 3 days to even after more than 7 days. This delayed and variation of reporting time might be due to lack of awareness or due to variation of distance. No positive finding in favour of sexual intercourse was found in maximum (72.4%) of cases. We found that about one third cases were gang rape, committed by two or more offender. Also OCC plays a vital role for rape victim's managements. The one-stop crisis centre, which was formed at the emergency block of Dhaka Medical College Hospital (DMCH) on 2001 to provide medico-legal assistance for victims of physical and sexual assaults, has turned more into a medical treatment centre. The idea behind the initiative was to provide all required services for a woman-child victim of violence in one place. The OCC was to provide health care, police assistance, DNA test, social services, legal assistance, psychological counselling and

shelter service etc. Now OCC expand 8 divisional districts. All clinical and forensic examination was done at the OCC and all specialist from relevant department came to the OCC ward for treatment of the victim if necessary. Establishment of "One Stop Crisis Centre" in Dhaka Medical College Hospital and Sylhet Medical College Hospital to provide women & child survivors of violence with comprehensive medical care, counselling, reporting of crime and related investigation was brought into light by combined effort of Naripokkho, Royal Danish Embassy in Dhaka, Ministry of Women & Child Affairs, Health & Family Welfare, Home Affairs, Social Welfare & Information. Although this concept has been pioneered in Malaysia by Dr. Abu Hassan Asaari Bin Abdullah, Senior consultant Traumatologist and Head of Emergency Department, Kuala Lumpur General Hospital Malaysia, it begin to work in DMCH on 19th August 2014<sup>12</sup>. Management of OCC Management strategies are based on need where services are patient focused and all services for total patient care come to the ward. Patient need not go to the different places. OCC has succeeded in drawing public confidence because the survivors come for help at the centre. Before the establishment of the centre many survivors were hesitant to come forward due to the tedious, painful and emotional process involved. Now they can approach the centre and appropriate actions will be taken.

### Conclusion

The violence against women is a global pandemic and there has been dramatic increase of sexual assault, and especially of acquaintance rape. Rape in familiar settings, such as schools, family homes, and neighbors and friends' homes, rape by policemen and rape by political influential's are common. Generally they do not want to disclose their ordeals due to social stigma and due to further harassment they may face from the powerful antagonists. OCC helps them from beginning to ending. So we must take proper action against rape otherwise day by days increasing alarming sign. Perpetrators of rape must be prosecuted and punished to the fullest extent of law. Public awareness about rape, expanding counseling and advocacy services for the victims, would be effective in increasing willingness of victim to report to proper place in due time with preserving the evidence.

### Disclosure

All the authors declared no competing interests.

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## Self-Monitoring of Blood Glucose: An Indispensable Tool for Diabetic Patients

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### ABSTRACT

Self-Monitoring of Blood Glucose is an integral part of Diabetes management. It's an invaluable tool to guide the Physician to understand the detailed glycaemic status of the diabetic patient and initiate a treatment plan. It also allows the modification, titration and adjustment of insulin's dose and time. The patients should carry out SMBG during intercurrent illness. This detects early deterioration of blood glucose control, thus helping the patient avoid diabetes emergencies and complications. It also improves the patient's ability to recognize hypoglycemia and hyperglycemia, helps prevent hospital admission and promotes patient's education. There is evidence that increased daily frequency of SMBG correlates linearly with HbA1c reduction, thus favoring improved outcomes. There are several recommendations by International Associations like NICE and ADA which are explored in great detail in this article. Moreover, the potential applications, limitations and feasibility of daily SMBG measurements have been clearly outlined in this article concluding that DSME is an essential component for all patients with diabetes and it helps to get immediate feedback and data which enables patients with diabetes to assess the effect of physical activity, medications and their food choices on blood glucose control.

**Key words:** SMBG; NICE; ADA; DSME; DSMS.

### Introduction

Diabetes is a complex, chronic illness requiring continuous medical care with multifactorial risk-reduction strategies beyond glycaemic control. Ongoing patient self-management education and support are critical to preventing acute complications and reducing the risk of long-term complications. It is characterized by FPG  $\geq 126$  mg/dl or 2-h PG  $\geq 200$  mg/dl after a standardized Oral Glucose Tolerance Test (OGTT) or an A<sub>1C</sub> level of  $\geq 6.5\%$ . A Random Blood Sugar (RBS) of  $\geq 200$  mg/dl can also be diagnostic for Diabetes for those with classical symptoms of hyperglycaemia. Self-Monitoring of Blood Glucose (SMBG) is a very useful tool for people with diabetes. It helps to maintain a good glycaemic control and minimize the complications of diabetes. The main goal of SMBG is to provide the patient and physician with detailed information about blood glucose level several times a day, thus guiding the treatment plan. SMBG gives more information about the outcome of the management adjustment, which may impact the long standing glycaemic control. SMBG is considered

as an indispensable part of type 1 diabetes management, as well as for type 2 diabetes when insulin is a part of the treatment. It allows the modification, titration and adjustment of insulin's dose and time. The patients should carry out SMBG during intercurrent illness. This detects early deterioration of blood glucose control, thus helping the patient avoid diabetes emergencies and complications. It also improves the patient's ability to recognize hypoglycemia and hyperglycemia, helps prevent hospital admission and promotes patient's education. There is evidence that increased daily frequency of SMBG correlates linearly with HbA1c reduction, thus favoring improved outcomes.

### Search Strategy

Available studies and abstracts were identified through PubMed and Medline data bases (From 2001-2016) and Cochrane data bases. Key search terms were diabetes and depression. All available studies and abstracts describing the relationship between SMBG and Diabetes were included. The reference list of review articles were also searched.

### Discussion

#### National Standards for SMBG

ADA Recommendations for Self-Monitoring of Blood Glucose (SMBG)<sup>1</sup>.

Those patients on Multiple-Dose Insulin (MDI) or insulin pump therapy should perform SMBG (Level of evidence B\*):

- At least before main meals and snacks
- Sometimes following meals

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- At bedtime
- Before exercise
- If they believe they are hypoglycemic
- Following treatment of hypoglycemia until blood glucose within normal range
- Before undertaking important tasks like driving<sup>1</sup>.

In those patients who use less regular insulin injections or are on diet or oral medications, SMBG values may help guide treatment (Level of evidence E\*)<sup>1</sup>.

When advising patients to self-monitor blood glucose levels, it should be ascertained that patients are regularly assessed for SMBG technique<sup>1</sup>. Patients should understand SMBG results and be able to alter therapy based on SMBG values (Level of evidence E\*)<sup>1</sup>.

\*Level of Evidence B indicates supportive evidence from well-controlled cohort studies

\*Level of Evidence E indicates expert consensus or clinical experience.

#### NICE Recommendations for SMBG<sup>2</sup>:

I. SMBG should be offered to:

- Patients on insulin
- Patients on oral hypoglycemic agents to get insight on hypoglycemic episodes
- Assess alterations in blood glucose as a result of medication and lifestyle changes
- Monitor effects of illness on blood glucose
- Assess safety during activities, like driving.

II. Offer SMBG to the patient who is newly diagnosed with type 2 diabetes only as an integral part of self-management education with discussions on its use and interpretations.

III. Structured annual assessments of:

- Skills on Self-monitoring
- How frequently BGs are tested
- Quality of testing
- How it's affecting quality of life
- Benefits of continuing and appropriate use of equipment.

IV. If blood glucose monitoring is not acceptable to an individual who is willing to self-monitor otherwise, then use of urine glucose monitoring can be offered.

#### Potential Applications and Recommendations for SMBG

Self-monitoring of blood glucose is important for all patients with diabetes; it helps to get immediate feedback and data which enables patients with diabetes to assess the effect of physical activity, medications and their food choices on blood glucose control<sup>3</sup>.

It also guides patients in evaluating their diabetes management through lifestyle modification.

An ADA consensus conference held in 1994 outlined the potential applications for SMBG data and this is outlined in the table below (Table I). Most of the applications are related to insulin therapy<sup>3</sup>.

A recent recommendation was made by another consensus in 2009 by International Diabetes Federation (IDF) which highlighted the recommendations for patients on non-insulin treatment. It stated that, in order to improve outcomes, an educational program should be implemented; the diabetes treatment should be individualized and health care providers have to play an active role in diabetes treatment (Table 2)<sup>3</sup>.

**Table I : Potential Applications for SMBG Data<sup>1</sup>**

- Achieve and maintain target goals for blood glucose
- Prevent and detect hypoglycemia, including hypoglycemia unawareness
- Prevent and detect hyperglycemia and avoid diabetic ketoacidosis or hyperglycemic hyperosmolar syndrome
- Evaluate the glycemic response to types and amounts of food and physical activity
- Determine appropriate insulin -to-carbohydrate ratios, correction factors, and basal insulin rates for intensive management (Multiple daily injections and insulin pumps)
- Adjust treatment in response to changes in lifestyle and the need to add, subtract, increase, or decrease dosages or types of pharmacological therapies
- Determine the need for adjustment in insulin dosages during illness
- Determine the need for insulin therapy in gestational diabetes.

( Diabetes Spectrum Volume 26, Number 2, 2013 )

**Table II : SMBG Recommendations for People With Noninsulin-Treated Type 2 Diabetes<sup>5</sup>**

- The purpose of performing SMBG and using SMBG data should be agreed on between the person with diabetes and the HCP and documented
- Consider using SMBG at the time of diagnosis and as part of ongoing Diabetes Self-Management Education (DSME) to facilitate timely treatment and tirration optimization
- Consider SMBG as part of ongoing DSME to assist people with diabetes to better understand their disease and provide a means to actively and effectively participate in its control and treatment
- SMBG should be used only when individuals with diabetes (And/or their caregivers) and / or their HCPs have the knowledge, skills and willingness to incorporate SMBG monitoring and therapy adjustment into their diabetes care plan to attain treatment goals

- SMBG protocols (Intensity and frequency) should be individualized to address individuals' specific education/behavioral/clinical requirements
- SMBG use requires an easy procedure for patients to regularly monitor the performance and accuracy of their glucose meter.

The aim of SMBG education is to make sure that patients with diabetes who are using a glucometer are able to do the blood glucose tests, and can interpret the result. Confidence is very important for diabetic patients using SMBG.

### Components of SMBG Education

#### Operating SMBG

Patients with diabetes should be instructed and educated by a health care professional about all components of SMBG. There are now 20 kinds of blood glucose meters available in the market. Most of them are accurate with 10 % +/- variability<sup>4</sup>. A small drop of blood from the tip of a finger is applied on a disposable test strip and within second's blood glucose levels are displayed on a digital screen.

Due to the advancement of technology, the old meters have become obsolete owing to its disadvantages and limitations. The first advancement has been in the introduction of alternate testing sites from the conventional fingertips to the palms and avoiding the pain and soreness of repeated testing. Second is the avoidance of strip to meter coding errors. Thirdly, the convenience of putting multiple strips in one meter has been implemented giving more flexibility of infrequent strip changing. Downloadable meters have also been introduced in recent years. These allow storing results in software to be examined by patient and health care professional to guide in diabetes management<sup>5</sup>.

#### Practical Limitations to SMBG Testing

- Financial implications: glucose meters and strips are expensive
- Discomfort of finger pricks
- Inconvenience of testing outside home
- Glucose meters need to be calibrated and patients are required to know to operate the meter
- Inaccurate readings: wrongly calibrated apparatus, misinterpretation on behalf of the patient, expired test strips, testing strips exposed to high temperatures, testing at high altitudes
- Contamination of sampling site
- Lack of time for frequent SMBGs
- Visually impaired patients cannot operate the meter or interpret results.

### Continuous Glucose Monitor (CGM)

Continuous Glucose Monitor (CGM) is another way of SMBG, operated by measuring interstitial fluids glucose levels and transmitting values to the meter every 3 minutes over a 24-hour period. Patients with type1 diabetes can benefit the most from this way of testing<sup>6</sup>. Currently CGM is used for detecting repeated hypoglycemia and hyperglycemia and for identifying hypoglycemic unawareness. However, the device needs calibration and is expensive, so its use is limited<sup>7</sup>.

#### Interpreting SMBG Data

This is of great importance in clinical decision-making, both for patient and health care provider.

Interpretation has three components:

- The patients should know blood glucose targets.
- Appropriate frequency and timing of the test.
- Application in decision-making<sup>3</sup>.

#### ◆ Knowing of Blood Glucose Targets

- The patient should be aware of blood glucose targets.
- It can be followed according to the set guidelines of either ADA or AACE.

#### ◆ Appropriate Frequency and Timing of Glucose Test

- There is no set rule
- It depends on multiple factors:
  - i) Which type of diabetes?
  - ii) Patient is willing to do or not?
  - iii) Physical capability to perform the test
  - iv) What medications they are on?
  - v) Daily schedule and life style
  - vi) Are they able to take action?
  - vii) Financial limitations (Coverage by insurance)<sup>3</sup>.

*Ideally for patients on insulin blood glucose testing should be done:*

- i) Before meal
- ii) 2 hours after meal
- iii) Bedtime
- iv) Before exercise
- v) To check if symptoms of hypoglycemia and after treatment of hypoglycemia
- vi) Driving: 2 hour before driving and at intervals of 2 hour at long journeys (The same for patients on sulphonylureas)<sup>3</sup>.

#### ◆ Testing Regimens

Different regimens are available which should be selected according to the patient willingness. It includes:

- i) 3 point regimen (Fasting, around largest meal) It especially helps newly diagnosed type2 diabetes patients.
- ii) 5 point regimen (Pre and post breakfast, post lunch, pre and post supper)

- iii) 7 point regimen (Pre and post breakfast,pre and post lunch, pre and post supper, bedtime)
- iv) Staggered SMBG profile (5-point, 7-point and staggered regimen shows impact of food on glycaemic control)<sup>8</sup>.

**Application in Decision Making**

The whole idea of testing is to get a good glycaemic control by adjusting the insulin treatment, avoidance of specific food and to see the effect of exercise.

Examples:

**Fasting**

Shows the effect of medication given at bedtime.

**Pre-meal**

Shows how much basal insulin is needed.

**Post-meal**

Shows the effect of pre-meal medication or the effect of meal itself.

**Bedtime**

Shows the effect of last meal and assess the requirement of basal therapy.

**Random**

Reflect the cause of presenting complains<sup>3</sup>.

**Evidence for the Benefits of DSME and DSMS**

Diabetes Self-Management Education (DSME) is the corner stone of diabetes care. It is an ongoing process that seeks to facilitate patients with the appropriate knowledge and skills in order for them to self-manage their diabetes. The objective of DSME is to improve clinical outcome and the quality of life by giving the patient the necessary support for future self-management and informative decision-making.

Systematically reviewed studies have shown that diabetes education is effective for improving clinical outcomes and quality of life, in the short term. It is evident that approach to self-management education has changed from didactic to empowerment<sup>9</sup>. Modern approaches focusing on giving the patient the appropriate knowledge have proven to have a positive impact on glycaemic control in short term but mixed results when patients were followed up a year after.

Self-management interventions were effective when assessing dietary behavior. There is no difference in outcome when using group or individual interventions. However group interventions are preferred because they are cost effective<sup>10</sup>.

It appears that culturally appropriate diabetic health education for ethnic minorities is effective with regards to glycaemic control and improvement of total cholesterol levels<sup>11</sup>.

Diabetes self-management care is also highly effective among socially disadvantaged populations<sup>12</sup>.

Further research is needed to assess the effectiveness of self-management and the long-term effects.

**Reviews / Meta-analyses**

Several literature reviews and meta-analyses were published since 2008, which have shown significant if modest reductions in HbA<sub>1C</sub>. There were, however, a number of confounding factors in these trials including lack of an educational component, small sizes, and low baseline HbA<sub>1C</sub><sup>13-15</sup>.

**Observational / Longitudinal studies**

There have been conflicting results from large- scale epidemiological studies, a summary of the main ones is in the following table.

Study	Description	Results
QuED <sup>16</sup> 2005	Impact of SMBG on metabolic control (A study looking at quality of life and ED primarily) 1,896 patients over 3 years	SMBG did not predict better control, there were no identified subgroups with lower HbA <sub>1C</sub>
ROSSO <sup>17</sup> 2006	Relationship between SMBG and morbidity and mortality 3,268 from diagnosis for a mean of 6.5 years	SMBG associated with decreased severe morbidity and all- cause mortality
Kaiser Permanente <sup>18</sup> 2006	Association between SMBG and glycaemic control 16,091 new SMBG users and 15,347 ongoing users over 4 years	SMBG use associated with decrease in HbA <sub>1C</sub> in new users relative to ongoing users
Fremantle Diabetes Study <sup>19</sup> 2007	Longitudinal data from 1,289 patients over a 5 year period Assessed whether SMBG is a predictor of improved outcomes	SMBG 48% decrease risk of CVS mortality in insulin treated patients, but a 79% increase in NIT T2DM  SMBG 48% reduced risk of retinopathy Inconsistent findings

**Randomized control studies**

This is obviously the gold standard for evidence based; older studies have been of limited value because they did not include an educational intervention, with small sizes, and other confounding factors. Recent studies have better design and showed benefits of SMBG.

Study	Description	Results
King-Drew Medical Centre Trial <sup>20</sup> 2005	Randomized, single blind - clinical management decisions blinded to SMBG data and use 89 NIT T2DM for 6 months	No statistically significant difference



Study	Description	Results
DiGEM <sup>21</sup> 2007	3 arm, open randomized trial Usual care vs SMBG alone vs SMBG with education incorporating into self - management 453 patients for 1 year	No statistically significant difference
ESMON <sup>22</sup> 2008	Prospective, randomized trial SMBG vs no monitoring 184 NIT T2DM no previous use over 12 months	No significant difference in HBA <sub>1C</sub> , 6% higher depression score in the SMBG group
DINAMIC <sup>23</sup> 2008	Multicenter, randomized, parallel group No monitoring vs SMBG 610 T2DM 27 weeks	Significantly larger decrease in HBA <sub>1C</sub> in the SMBG group Hypoglycemia lower in SMBG group
St. Carlos Study <sup>24</sup> 2010	Randomized to SMBG intervention vs HBA <sub>1C</sub> based control group Newly diagnosed T2DM over 1 year	Significant reduction in HBA <sub>1C</sub> and BMI in the SMBG group with increased lifestyle scores
STeP <sup>25</sup> 2011	Prospective, multicenter randomized study  2 groups - enhanced usual care vs enhanced usual care PLUS at least quarterly use of SMBG 483 NIT T2DM over 12 months	Significant improvement in glycemic control, facilitating  timely and aggressive treatment changes in the SMBG group
ROSES study <sup>26</sup> 2011	Open label, randomized study Usual care vs SMBG use led by diabetic nurses	Improved metabolic control through lifestyle measures and weight loss

Although results from the studies are mixed, the newer evidence suggests that the use of SMBG is associated with improved glycemic control, but must be used as part of a comprehensive, ongoing education program that involves management changes based on the SMBG results.

### SMBG and Health Care Professionals

#### Professional support

- Health Care Professionals (HCP) should monitor the patient monitoring technique initially and after wards periodically as the accuracy is user dependent and equipment as well
- Frequent and regular calibration especially in situations like new glucometer, new pack strips, exposure to temperature, exposed to open air for a prolonged period by both the patient as well as health care provider guidance ensures accuracy and reliability of readings

- Health care providers should also educate the patient that the plasma and blood sugar vary by 10-15 % and that home glucometers will calibrate/ monitor the same patients must be educated about the same whether their glucometers monitor the blood or plasma glucose and act accordingly
- It is not enough monitoring results should be properly analyzed, interpreted, and advised accordingly. Patients should be taught how to modify the life style modifications and adjust the treatment to achieve the individualized glycemic targets
- HCP should monitor and teach the patients how to utilize the SMBG data for guidance to treatment. Patients can record the data in a logbook or computer and both the method sareequally effective.

#### Social support

- Social support and constant education during visits provided by HCP, diabetic instructors and nurses is very much instrumental in achieving adequate monitoring, weight loss and HBA<sub>1C</sub> lowering, and improved compliance and adherence to diet and medication and exercise
- The quality of patient- doctor relationship has a very big impact on the adherence to SMBG monitoring.

#### Organizational support

- Appointments reminders (eg. phone calls) will promote adherence to treatment and monitoring and aid in elevating motivational levels.

#### Evidence around health care professional support/role and SMBG

A study showed that regular telephonic calls and at the same time discussing the investigation updates promoted reduction in blood pressure and glucose and lipids. An observation in DCCT was glucose lowering due to constant guidance and monitoring and availability of support health care team. Studies showed that a very good and strong patient and physician relation improved adherence to diabetic regimens whereas as dismissive physician and patient relation resulted in poorer adherence to SMBG and medications<sup>27-33</sup>.

#### Cost Effectiveness of SMBG and Reimbursements for DSME

Usually, reimbursement of DSME/T depends on the policies of the patient. These plans cover all diabetes education and training, which is given by qualified physicians to patients with type1/type 2 diabetes, Gestational Diabetes Mellitus, non-dialysis kidney disease etc. DSME/T can be provided by either physicians or health care professionals that have underwent accredited training programs (By ADA, AADI). Concerned government or private insurers provide funding for these programs. Billing can be done with the help of relevant codes according to the Current Procedural Terminology (CPT)<sup>34</sup>.

The allowed number of visits for DSMT involves from first year of diagnosis-one hour of initial visit and nine hours of follow up visits with the practitioner, then 2 hours annually<sup>35</sup>.

Medicare has very specific coverage policies for DSMT. It only covers if the treating physician or qualified practitioner who is managing the patient with diabetes certifies that such service is needed. They should also document the need for education or training<sup>36</sup>.

In patients with type 1 diabetes and type 2 diabetes on insulin therapy, increased frequency of SMBG has been associated with a decreased HbA1c and with fewer complications. The evidence for the benefits of frequent SMBG testing in type 2 diabetes patients on noninsulin therapy is however, inconclusive. Several RCTs have outlined that routine SMBG testing in non-insulin treated patients is not cost-effective or clinically useful<sup>37</sup>.

### Conclusion

SMBG is an indispensable and invaluable tool in the self-management of diabetes patients on insulin. However, there is less evidence to support the frequent use of SMBG in non-insulin treated diabetes patients and therefore the decision to recommend SMBG should be based on personal preferences, cost and individual health-care system sources. There should be a priority list to decide which patients are eligible for frequent SMBG testing. These include newly diagnosed patients with diabetes, those with sedentary or erratic lifestyles, those with frequent hypoglycemia and particularly for those who are keen to maintain intensive glucose controls. There is no evidence to suggest the use of SMBG for those patients managed by lifestyle modifications alone.

The advantages of SMBG in relation to improved knowledge of diabetes and self-care behavior, improved HbA<sub>1c</sub>, weight reduction and improved quality of life clearly outweighs the limitations (Fear of finger pricking and associated pain, cost of strips and meter and inaccurate meter readings) of frequent SMBG testing.

Patients should have access to DSME and DSMS for improving clinical outcomes and quality of life and government or private insurers should focus on funding for these services. Patients should know how to operate the meter, understand the sites of blood glucose monitoring, have knowledge of the blood glucose targets, and have a clear idea about the appropriate timing and frequency of glucose tests as well as be able to act accordingly.

Finally, CGM could be used as an effective alternative to SMBGs provided that it becomes cost-effective, readily accessible and the technical implications have been dealt with.

### Disclosure

All the authors declared no competing interests.

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## Metformin and Glyburide Use In Pregnancy: An Evidence Based Approach

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### ABSTRACT

Management of Diabetes Mellitus (DM) during pregnancy is crucial to ensure the satisfactory outcomes for both the mother and foetus. Lifestyle modification is the first step in the management regime, and if it fails, clinicians prescribe the oral or injectable antidiabetic drugs. Insulin is considered the gold-standard treatment for managing DM during pregnancy. However, for the cost and potential side-effects of insulin, oral antidiabetic drugs like metformin and glyburide are now getting popular amongst the prescribers. This article appreciates the current evidence on metformin and glyburide use during pregnancy and their effects on maternal and foetal outcomes. The article gives the readers a platform for rational thinking before prescribing metformin and glyburide for the management of DM during pregnancy.

**Key words:** Diabetes Mellitus; Pregnancy; Gestational Diabetes; Antidiabetic drugs; Metformin; Glyburide.

### Introduction

The prevalence of Diabetes Mellitus (DM) among pregnant women is rising globally<sup>1</sup>. Inadequate management of DM during pregnancy may bring adverse health outcomes to both the mother and foetus, e.g., macrosomia, preterm delivery, hypoglycaemia, etc<sup>2</sup>. The first step towards achieving optimal control over blood glucose during pregnancy is lifestyle modification. Antidiabetic drugs are introduced if lifestyle modification alone fails to control blood glucose in a timely fashion. For the efficacy, Insulin is considered the gold-standard treatment for managing gestational diabetes<sup>2</sup>. However, patients could be non-compliant with insulin therapy as it requires multiple daily doses. Insulin may cause weight gain, hypoglycaemia and may not be affordable. Considering the issues surrounding insulin therapy, different oral antidiabetic drugs are getting more attention from the clinicians<sup>2</sup>. Recent studies suggested that oral antidiabetic drugs like metformin and glyburide could be used for managing DM in pregnancy. A reasonable amount of data have sparked the debate whether these drugs could be the safer and better alternatives to insulin. The discussion in this article concentrates on metformin and glyburide, the two most common drugs prescribed during pregnancy. The authors discussed the studies comparing metformin and glyburide to insulin for the management of DM during pregnancy.

### Search Strategy

Five databases namely Medline (1946-present) Cochrane Library, Embase, Scopus and CINAHL were searched using the terms 'Diabetes' and 'Pregnancy' and 'Drugs', 'Pregnancy' and 'Metformin', 'Pregnancy' and 'Sulfonylureas', 'Pregnancy' and 'Glyburide', 'Gestational Diabetes' and 'Treatments'. Randomized Controlled Trials (RCTs) and meta-analyses published in English were selected for this narrative review.

### Use of Metformin in Pregnancy

A 2013 meta-analysis of three RCTs of gestational diabetes patients found that the fasting and post-prandial blood glucose was lower in the metformin group than the insulin group, but the difference was statistically non-significant. The difference in average HbA1c% level at 36-37 week of pregnancy was also statistically non-significant<sup>3</sup>. The meta-analysis reported lower neonatal birth weight (Statistically non-significant) lower average gestational ages at delivery (Statistically significant) and lower incidence of pregnancy-induced hypertension in the metformin group than in the insulin group<sup>3</sup>. Interestingly, the pre-term delivery rate was significantly higher in the metformin arm. Treatment failure rate was also higher for the metformin group. There was no significant difference in the incidence of pre-eclampsia and the caesarean delivery rate between the metformin and insulin groups<sup>3</sup>. Between the two groups, the pooled result in this meta-analysis didn't show significant difference in incidence of shoulder dystocia, incidence of hypoglycaemia, large for gestational age infants rate, small for gestational age infants rate; admission to the Neonatal Intensive Care Unit (NICU) birth defect rate and in 5 minutes Apgar score<sup>3</sup>. Metformin has been shown to pass across the placenta and two studies showed that the foetus could be exposed to

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metformin as high or higher than the mother<sup>4,5</sup>. Non-randomised evidence is available regarding teratogenicity, and metformin was not considered teratogenic in these evidence<sup>6</sup>. Limited data showed that the women on metformin could safely breastfeed their infants<sup>7</sup>. Long-term safety data on the infants whose mother were treated with metformin during pregnancy is scarce<sup>8</sup>. The MiG study (Metformin in gestational diabetes study) compared the infants of the women treated with metformin during pregnancy to those treated with insulin at their two years of age. Healthier fat distribution was found in the infants whose mothers were treated with metformin during pregnancy<sup>9</sup>. As the effects of gestational diabetes on childhood obesity do not manifest until 6 to 9 years of age<sup>10</sup>. Long-term follow-up studies are needed to evaluate the effect of in-utero exposure to metformin on childhood obesity and subsequent development of later-life overt diabetes<sup>10</sup>.

#### Use of Glyburide in Pregnancy

A systematic review of three RCTs (n=478) found no differences in fasting blood glucose or 2-hour post-prandial glucose between the glyburide and insulin group<sup>11</sup>. A 2013 prospective Indian study found no significant difference in blood sugar control between the glyburide and insulin group (n=64)<sup>12</sup>. Interestingly, one RCT found lower fasting blood glucose and 2-hour post-prandial glucose in insulin group when compared to the glyburide group<sup>13</sup>. The meta-analysis by Nicholson W et al. showed a similar rate of caesarean deliveries between the glyburide and insulin group<sup>11</sup>. Another meta-analysis by Dhulkotia JS et al showed similar maternal outcomes in the glyburide and insulin group<sup>14</sup>. The incidence of maternal hypoglycaemia was lower for the glyburide group in one study, but the opposite finding was found in two other studies<sup>15-17</sup>.

In comparison to first-generation sulfonylureas, placental transport of glyburide has shown to be significantly lower<sup>18</sup>. In a randomised study, comparing glyburide to insulin, glyburide was absent in the cord blood for any infant<sup>19</sup>. A study of 147 women reported no incidence of congenital malformations as a result of exposure to glyburide<sup>20</sup>. In one RCT, among the women who took glyburide during pregnancy, the incidence of neonatal hypoglycaemia was significantly higher than the women on insulin but another RCT reported the opposite finding<sup>13,15</sup>. There is no quality study exploring the safety of glyburide in breastfeeding mothers. Long-term safety data on the children exposed to in-utero glyburide is also absent.

#### Comparing Metformin Use to Glyburide Use in Pregnancy

In a comparative study of 200 women with gestational diabetes, participants were randomised to metformin (n=104) or glyburide (n=96) use. Between the two groups, there was significantly lower neonatal birth weight in the metformin group and lower blood glucose (At the 1<sup>st</sup> hour) levels in the glyburide group. There was no statistically

significant difference in gestational age at delivery, the percentage of caesarean deliveries, the incidence of neonatal hypoglycaemia, admission to NICU and perinatal death between the two groups<sup>21</sup>. Another study comparing the efficacy of metformin to glyburide for blood glucose control in gestational diabetes found no significant difference in the mean fasting and 2-hours postprandial glucose. In this study, those individuals who failed to achieve the optimum glycaemic control with either metformin or glyburide were further treated with insulin. Between these two groups, the incidence of preeclampsia and maternal hypoglycaemia was not different. The average birth weight was significantly smaller in the metformin group. Interestingly caesarean deliveries were significantly higher in the metformin group than in the glyburide group. Neonatal outcomes like neonatal hypoglycaemia, shoulder dystocia and admission to NICU did not differ between the groups<sup>22</sup>.

#### Current Guidelines and an Evidence-based Approach towards Prescribing Metformin and Glyburide in Pregnancy

There is a paucity of data on the safety of metformin and glyburide during pregnancy and breastfeeding. More quality studies are needed to explore these drugs' effects on the mothers and fetuses. Long-term follow-up studies are warranted to evaluate the in-utero exposure to metformin and glyburide. Keeping these facts in mind, the clinicians should not be tempted to prescribe metformin and glyburide only because they are cheaper and convenient than insulin. The US Food and Drug Administration (FDA) does not approve any oral antidiabetic drug use in pregnancy<sup>23</sup>. On the other side, the National Institute for Health and Care Excellence (NICE) guidelines in the UK consider metformin and glyburide safe during pregnancy<sup>24</sup>. There is no Bangladesh therapeutic guideline addressing the management of diabetes during pregnancy.

#### Conclusion

Till this date, without controversy, insulin remains the only evidence-back standard treatment option for gestational diabetes and should be practised as such until there is stronger evidence available on the safety of metformin and glyburide. There has been no RCT in Bangladesh comparing the efficacy of metformin and glyburide on glycaemic control as oppose to insulin. Bangladeshi doctors should reach out for epidemiological evidence that suits the country's context and meets the safety profile for the patients. Oral antidiabetic drugs like metformin and glyburide should only be reserved for those pregnant women who do not consent to take insulin, and lack of the long-term safety data on metformin and glyburide should be discussed with them before prescribing.

#### Disclosure

Both the authors declare no competing interests.



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## Hirsutism and Menstrual Disturbance Sometimes Associated with Cushing Syndrome Due to Adrenal Adenoma

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### ABSTRACT

To report a case of hirsutism & secondary amenorrhoea with cushing syndrome due to adrenal adenoma in a 16 years old girl. Clinical, biochemical, radiological and histopathological data of a 16 years old girl are reported in whom cushing syndrome due to adrenal adenoma with hirsutism & Secondary amenorrhoea.

**Key words :** Cushing syndrome; Polycystic ovarian syndrome; Adrenal adenoma; Menstrual disturbance.

### Introduction

CUSHING'S syndrome is 4 times more common in women than men, and menstrual disturbance is a frequent complaint at presentation. The mechanism responsible for this alteration has not yet been established, although a relationship to excessive adrenal androgen levels is often presumed. However, it is known that, chronic hypercortisolemia suppresses gonadotropin release by inhibiting the secretion of GnRH from the hypothalamus. GnRH neurons are known to express glucocorticoid receptors, thus indicating a possible mechanism by which hypercortisolemia can block GnRH/gonadotropin release and be responsible for the menstrual disorders associated with Cushing's syndrome<sup>1,2</sup>.

Hirsutism is a common disorder, often resulting from conditions that are not life-threatening. It may signal more serious clinical pathology, and clinical evaluation should differentiate benign causes from tumors or other conditions such as polycystic ovary syndrome, late-onset adrenal hyperplasia, and Cushing's syndrome. Women with irregular menses and hirsutism should be screened for thyroid dysfunction and prolactin disorders<sup>3</sup>.

Pharmacologic and/or nonpharmacologic treatments may be used. Advances in laser hair removal methods and topical hair growth retardants offer new options. The use of insulin-sensitizing agents may be useful in women with polycystic ovary syndrome.

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### Case Reports

A 16 year old girl presented with excessive weight gain, facial swelling, 2ndary amenorrhoea and excessive hair growth in upper lip and supra orbital ridges. On examination, pt looks depressed. There is excessive hair growth in upper lip and supra-orbital ridges. She is overweight, with more truncal obesity and relatively lean and thin limbs. Face is plethoric, moon like and puffy. There is buffalo hump at the roof of the neck. There are multiple purplish striae on abdomen, back, axilla, both upper arms

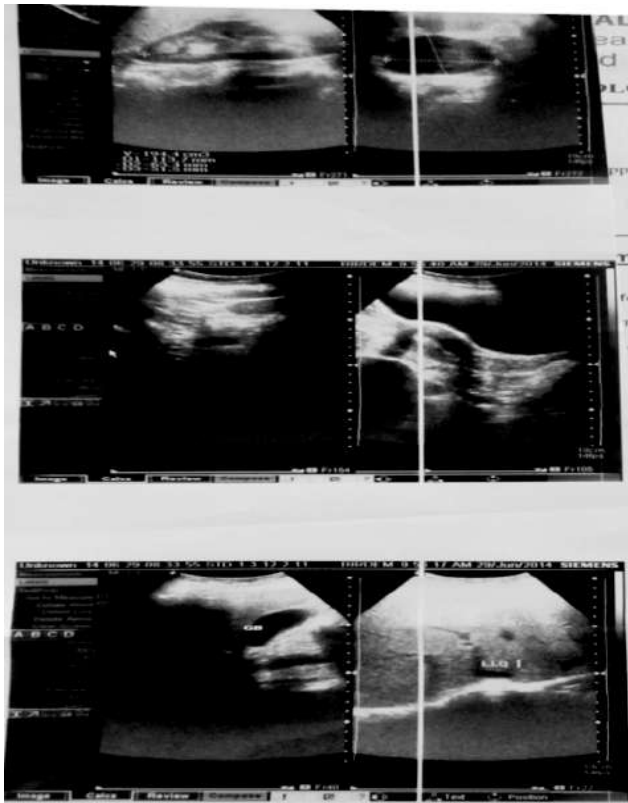


**Figure 1 :** Plethoric, puffy and moon like face

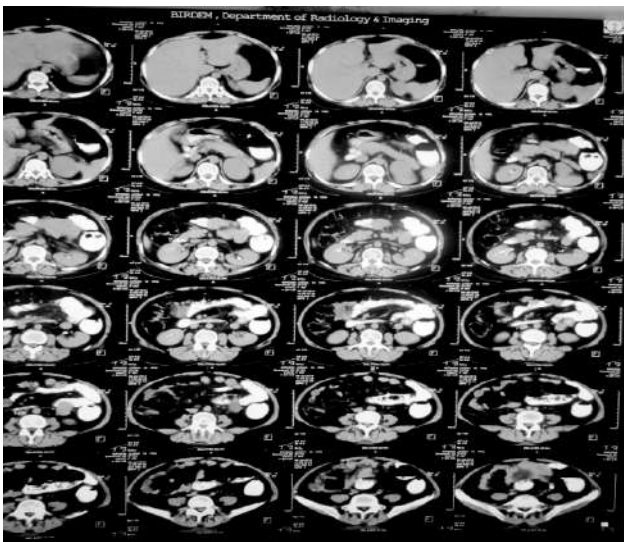
and thighs. Pulse is 90/m and Blood Pressure is 150/100 mmhg. Abdomen is distended. Muscle bulk is reduced in distal part of both lower limbs. Muscle power is reduced in proximal group of muscles of both lower limb.

S. Electrolytes: Na- 142 mmol/L, K-2.5 mmol/L, Cl-94 mmol/L, TCO<sub>2</sub>-36 mmol/L. OGTT : FBS- 5.0 mmol/L, 2 hour after glucose- 6.0 mmol. S basal cortisol- at 9.00 am 1010.70nmol/L and 5.00pm 908.10nmol/L. Over night dexamethasone suppression test- 921.70nmol/L .24 hours urinary free cortisol- 4950 nmol/24 hours urine . Midnight salivary

cortisol- 5.29nmol/L. ACTH- 5.0pg/ml .USG of whole abdomen- a Left suprarenal mass (65x54)mm. CT scan of abdomen- a well defined soft tissue density mass lesion is seen in left adrenal region measures about (4.2x6.2x0.6) cm. Histopathology of left sided adrenal mass-features are compatible with adrenocortical adenoma.



**Figure 2 :** USG of whole abdomen: Left suprarenal mass: A large (65x54)mm



**Figure 3 :** CT SCAN OF ABDOMEN: A well defined soft tissue density mass lesion is seen in left adrenal region measures about (4.2x6.2x0.6) cm. After IV contrast no significant enhancement is seen

**Discussion**

Among the causes of hirsutism around 95% are due to Polycystic Ovarian Syndrome (PCOS). The rest are due to others. Cushing syndrome is responsible for around 1%.The most common form of hirsutism vellus hypertichosis on the face,which should be distinguished darker terminal differentiated hirsutism due to Adrenocortico Tropic Hormone (ACTH) mediated androgen excess. PCOS also is the main cause of secondary amenorrhoea. Ovarian causes (PCOS & Premature ovarian failure) are almost 70%. Gonadal dysfunction is common with hypercortisolism which is direct inhibitory effect of cortisol upon GnRH pulsatility and Leutirizing Hormone / Follicle Stimulation Hormone (LH/FHS) secretion<sup>4,5</sup>.

**Conclusion**

So a patient of cushing syndrome due to adrenal adenoma may be presented with menstrual irregularity and hirsutism. Which can be reversed by correction of hypercortisolism.

**Disclosure**

All the authors declare no competing interest.

**Referances**

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