Original Article

Patient Empowerment: An Effective Strategy to Improve Management of GDM

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Abstract:

Background: *GDM is a public health issue, affecting mostly the South East Asian region, as well in Bangladesh (prevalence 9.7% - 12.9%). It has a significant adverse impact on maternal and foetal outcome. So it needs to be addressed energetically to avoid maternal and foetal morbidity and mortality. Also it will contribute a lot to the pool of Type II Diabetes as substantial number of GDM mother and their offspring may develop type II DM in near future. Self-management of GDM is well-known globally but there is still lacking in adequate handling of diabetes by the patients themselves. Nevertheless the lacking can be minimized through 'Patient Empowerment' by clear understanding of the disease and its consequences along with intense learning, training, monitoring and evaluation of the clients involved. Also it will help in emotional stability of the client which is an essential component of diabetes management during pregnancy. The innovative strategy may contribute significantly in GDM management at low cost in a resource constraint setting.*

Objective: *To find the effectiveness of 'patient empowerment' promoting better self-management of GDM.*

Methodology: *This quasi experimental study was done on 96 cases (48 in each group) by purposive sampling technique at Shaheed Suhrawardy Medical College Hospital (ShSMC) as study group & Rajshahi Medical College Hospital (RMCH) as control group, from August 2012 – August 2015. Both group were matched of age, parity, education and income. Ethical clearance was taken from ethical committee of both ShSMC and RMCH*

Result: *In the study group good glycemic control achieved with diet & exercise (75%) and Insulin required in only 25% cases, while in control group Insulin given in 75% cases. In the study group NVD (67%) were more than control group (33.3%). There were no obstructed labour in study group but control group (12.50%). Majority of the study group (74.6%) had no or minimum antenatal complication, in comparison to control group (74.66%). Regarding Neonatal outcome, neonatal resuscitation required none in study group but 12 (25%) in control group. So, overall adverse outcome observed less in study group than control group*

Conclusion: *Patient empowerment can be an effective tool to manage GDM cases with an outcome of good control of blood sugar; less antenatal, intrapartum and post natal complications, good foetal and neonatal outcome and low requirement of insulin.*

Key Words: Management of GDM

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Introduction

Gestational Diabetes Mellitus (GDM) is one of the major complications during pregnancy.[1] According to American Diabetes Society, GDM is defined as glucose intolerance with onset or first recognized during pregnancy.[2,3] Increasing unprecedentedly throughout the world, South East Asia is at high-risk of GDM, accounting for prevalence of 17%.[2] Importantly, GDM is a major threat to both mother and child health and gives rise to higher rates of maternal hypertension, pre-eclamsia, difficult labour and increase in surgical intervention. Major adverse outcome of fetus caused by GDM are preterm delivery, risk of stillbirth, hypoglycemia in newborn, hyperbilirubinemia, macrosomia and other metabolic disorder of the offspring.[4] In Bangladesh, GDM has become a serious public health issue given the fact that 9.7%[5] pregnant women are suffering from Gestational Diabetes Mellitus. Management of GDM is a complex procedure. First line management involves a self-management regimen based on regular blood glucose level (BGL) testing and dietary adjustment. Moreover, pregnant women are recommended to exercise regularly as it maintains BGLs through boosting metabolic rate.[6] The ultimate goal of treatment is to maintain BGL within recommended ranges. This is achieved primarily by deducting energy intake by replacing high calorie food with higher choice of low glycemic index diet. Self-management approach is based on dietary adjustment and exercise, suitable for approximately 65-90% women with GDM[7]. Women suffering from marked hyperglycemia and women unable to control BGL are recommended to treat with insulin therapy.[8] However, insulin administration at larger amount to maintain BGL of women with GDM put them at higher risk of developing type 2 diabetes in future. Taking into consideration all these serious implications, it is critical to ensure self-management of GDM. Food habit and lifestyle are major hindrances in the self-management of GDM. In Bangladesh, people have more carbohydrate than any other food. Rice is the main dish which is served 3 times a day in most of the households. The vegetables and fiber containing food intake is also insufficient. According to NCD risk factor survey in 2010, 95.7% people did not consume adequate fruit or vegetables on an average day.[9] Regular exercise is also not very common in our context which is an important aspect of GDM management. According to the survey, women were generally less active, around one third (33%) participants usually did not engage themselves into even moderate activity (such as brisk walking, household chores) and 62% people did not perform any vigorous physical activities such as running, cycling, swimming, climbing, lifting heavy weights etc. Given all these complex issues of social and lifestyle factors, self- management training is crucial to make the theory to practice for effective management of GDM. Patient empowerment imposes understanding of GDM & its possible effects on foetus and new born; intense training on self-blood glucose level (SBGL) estimation, evaluation, reevaluation of BGL level & self-tuning of diet & exercise according to need. When she is empowered to handle her BGL effectively usually she become emotionally stable. All these help in controlling GDM. Keeping all the above in mind, this study was undertaken to evaluate the effectiveness of this innovative strategy of 'patient empowerment' to manage GDM among cases admitted at tertiary level hospital of Bangladesh.

Methods:

This quasi experimental study was conducted from July 2012 to August 2015 (36 months), among the pregnant women with GDM attending the selective unit of department of Obstretic and Gynaecology, Shaheed Suharwardi Medical College Hospital (ShSMCH) as study group and Rajshahi Medical College Hospital(RMCH) as control group. Both the group were matched of age, parity, education and income. Respondents were recruited purposively according to inclusion and exclusion criteria. Pregnant patients having screening positive for GDM and gestational age between 20 to <36 weeks pregnancy were included in this study. Cases having gestational age over 36 weeks with GDM, pregnancy associated with DM, other co-morbidities like pregnancy associated hypertension, jaundice, severe anaemia etc. and those who were not willing to follow self-empowerment regimen were excluded. The control group were treated with existing GDM management protocol. In the study group, patients who became screening positive were admitted into ShSMC for successive 3-4 days to be trained on patient empowerment model. Along with usual obstetric care they were informed thoroughly about GDM, its consequences, basis of management; trained intensely about how to assess and monitor blood glucose level, its interpretation and tuning of diet according to calorie need, diet distribution and frequency. They were advised to keep a personal glucometer and guide book on diabetes management. Initially a daily calorie allowance was calculated and diet distribution was planned. They underwent blood sugar level estimation 6 times per 24 hours during their stay at hospital.

Patient empowerment model includes

- Make sense to the disease
- Develop personal goal matched with treatment goal.
- Patient should identify the barriers of GDM manage-ment.
- Service provider facilitate her to address the barriers
- Self assessment of BGL and tuning of diet & exercise

The stepwise management were as follows -

i) Screening (+ve) GDM case were admitted for 3-4 days.
ii) Calculation of daily calorie requirement was done.
iii) Then stepwise session I, II & III were demonstrated.
iv) Ante natal checkup were given as well.

The following group discussion were done stepwise

Session I

- Assurance and counseling
- Knowledge about –
  - Calorie met by diet & diet distribution
  - Frequency and interval of meal
  - Role of physical activities / exercise
  - Complete knowledge was given about GDM including blood sugar homeostasis. Diet distribution with different dietary source ie carbohydrate, protein & fat; symptoms of hypoglycemia, normal range of Blood Glucose Level (BGL) etc.

Session II

- Assurance to patient and family
- Training on –

  Blood glucose assessment & interpretation

  Maintenance of blood glucose chart

  Tuning of diet based on calorie

  Requirement of Insulin

  Techniques of Insulin injection

Session III & ongoing

- Assurance to the patient and family
- Tuning of diet based on calorie
- Evaluation of the understanding

When the service provider were satisfied about the BGL monitoring by the patient then they were discharged from the hospital to follow the advices at home.

At home

- Patient was advised to assess blood sugar randomly and keep on chart
- Interpreted blood sugar level and readjust diet schedule
- Kept records
- Came to antenatal checkup
- Were keen to foetal kick count
- Re-admission if insulin was needed
- Re-admission for any danger sign / confinement

When blood sugar failed to adjust with diet & exercise, Insulin was given & dose of insulin was tailored by adjusting diet & exercise. Exercise was be meant by their daily works & exercise with which they are used to. No extra exercise was advised.

Outcome Variables:

Following variables were measured to test the hypothesis

1. Maternal variables

i) Proportion of cases having good glycemic control,

ii) Modalities of treatment ie Diet only, Diet + Oral drugs, Diet + Inj. Insulin adopted to have good glycemic control

iii) Ante natal, intra natal and post natal complications related to Diabetes

iv) Mode of delivery

2. Fetal indicators
   i) Gestational age of the baby during delivery
   ii) Birth weight of the baby
   iii) APGAR Score
   v) Neonatal resuscitation needed or not

Regular antenatal checkup was done irrespective of gestational age & pregnancy tried to be continued upto term or till any situation arises that demands termination of pregnancy.

Mode of delivery was guided by obstetrical need. After delivery foetal height, weight & APGAR score was noted. Blood sugar assessed ½ an hour after birth. Babies were examined by a neonatologist immediately after birth and all the care to the baby were given according to existing protocol.

Results:

In this study there were total 96 respondents, 48 in both case & control group. The mean age of study group was 28.21 ± 5.139 and 29.69 ± 5.137 in control group. Among the study group and control group 59.5% and 40.5% had primary level education respectively. 40% of study group had secondary level of education and 60.0% of control group had the same level of education. There were also no significant difference in monthly income in both the group. In the study group, majority of the patient (75%) had good glycemic control with diet and exercise, only 25% required Insulin. On the other hand 75% of control group required Insulin and approx. 67% of study group delivered by NVD, whereas 33.3% of control group delivered by NVD. LSCS rate in study group was less (46.9%)in comparison to control group (53.1%).

Majority of the study group (74.6%) had no complication related to GDM such as vulvo vaginitis or polyhydramnios and only 3 (37.5%) cases developed PE which may be or may not be associated with GDM. On the other hand in control group, almost 74.66% patients suffered from GDM related complications evidenced antenataly like vulvo vaginitis and Polyhydramnios. Around 10% in study group and 90% of the control group had UTI. Among total cases, during intrapartum period 6 of control group contributed total of the obstructed labour (100%). Regarding adverse post natal outcome, PPH (5 patients, 100%) and wound infection (3 patients, 75%) occurred mostly in control group in comparison with study group 0% and 25% (1 patients) respectively.

In respect to neonatal outcome, neonatal resuscitation required in 12 (100%) cases of control group. So, overall adverse outcome observed more in control group in comparison with study group.

Table-I

Socio demographic variables

General Characteristics of the study population n = 96

Variables	Study Group	Control Group	P value
Age	28.21±5.359	29.69±5.137	0.171
Monthly Income	18104.17±10320.893	15104.17±5308.522	0.078
Parity	1.06±1.080	0.7510.668	0.092

*Student t test has been performed to see the level of significant

Table-II

Educational level of respondents n = 96

Level of education	Group Study group	Control group	Total	P value
Primary	22(59.5%)	15(40.5%)	37(100.0%)	
Secondary	18(40.0%)	27(60.0%)	45(100.0%)	
Higher secondary	0(0.0%)	4(100.0%)	4(100.0%)	0.013
Bachelor or higher	8(80.0%)	2(20.0%)	10(100.0%)	
Total	48(50.0%)	48(50.0%)	96(100.0%)	

* Pearson Chi Square has been performed to see the level of significant

Table-III

Modalities to control GDM (n = 96)

GDM Controlled with	Group Study group	Control group	Total	P value
Insulin	12(25.0%)	36(75.0%)	48(50.0%)	
Diet	36(75.0%)	12(25.0%)	48(50.0%)	0.0001
Total	48(100.0%)	48 (100.0%)	96(100.0%)	

* Pearson Chi Square has been performed to see the level of Significant

Table-IV

Mode of delivery (n =96)

Mode of delivery	Group Study group	Control group	Total	P value
NVD	10(66.7%)	5(33.3%)	15(100.0%)	
LSCS	38(46.9%)	43(53.1%)	81(100.0%)	0.211
Total	48(50.0%)	48(50.0%)	96(100.0%)	

* Pearson Chisquare has been performed to see the level of significant

Table-V

Maternal outcome (Antenatal) n= 96

Antenatal complications	Group Study group	Control group	Total	P value
No complication	44(74.6%)	15(25.4%)	59(100.0%)	
UTI	**1**(10.0%)	9(90.0%)	10(100.0%)	
Vulvo vaginitis	0(0.0%)	12(100.0%)	12(100.0%)	0.0001
Pre eclampsia	3(37.5%)	5(62.5%)	8(100.0%)	
Poly hydromnios	0(0.0%)	7(100.0%)	7(100.0%)	
Total	48(50.0%)	48(50.0%)	96(100.0%)	

Table-VI

Maternal outcome (Intra natal) (n = 96)

Intra natal complication	Group Study group	Control group	Total	P value
No problem	48(53.3%)	42(46.7%)	90(100.0)	
Obstructed labour	0(0.0%)	6(100.0%)	6(100.0%)	0.011
Total	48(50.0%)	48(50.0%)	96(100.0)	

* Pearson Chi Square has been performed to see the level of significance

Table-VII

Maternal outcome (Post natal) n = 96

Post natal complication	Group Study group	Control group	Total	P value
No complication	47(54.0%)	40(46.0%)	87(100.0%)	
PPH	0(0.0%)	5(100.0%)	5(100.0%)	0.038
Wound infection	1(25.0%)	3(75.0%)	4(100.0%)	
Total	48(50.0%)	48(50.0%)	96(100.0%)	

* Pearson Chi-Square has been performed to see the level of significant

Table-VIII

Apgar score in 1 min. n=96

Variables	Study group	Control group	Total	P value
4/10 to <8/10	3 20%	12 80%	15 100%	.011
8/10 to 10/10	45 55.6%	36 44.4%	81 100%	

• Pearson Chi-Square has been performed to see the level of significant

Table-IX

Apgar score in 5 min. n =96

Variables	Study group	Control group	Total	P value
4/10 to <8/10	1 7.1%	13 92.9%	14 100%	.001
8/10 to 10/10	47 57.3%	35 44.4%	82 100%	

* Pearson Chi-Square has been performed to see the level of significant

Table-X

Neonatal resuscitation needed (n = 96)

Neonatal resuscitation	Group Study group	Control group	Total	P value
Yes	0(0.0%)	12(100.0%)	12(100.0%)	
No	48(57.1%)	36(42.9%)	84(100.0%)	0.000
Total	48(50.0%)	48(50.0%)	96(100.0%)	

Pearson Chi Square has been performed to see the level of significance

Table-XI

Foetal outcome(weight) n = 96

Fetal weight (in kg)	Group Study group	Control group	Total	P value
<2.5	1 (14.3%)	6 (85.7%)	7 (100.0%)	
2.5 - < 4	46 (53.5%)	40 (46.5%)	86 (100.0%)	0.115
>4	1(33.3%)	2 (66.7%)	3 (100.0%)	
Total	48(50.0%)	48(50.0%)	96 (100.0%)	

* Pearson Chi-Square has been performed fo see the level of significant

Discussion:

GDM management is still a challenge for obstetrician and endocrinologist worldwide. The challenges are different in different context. 'Self-management' is a good option and well accepted in any situation but the effective way of self management is an important issue of debate upto now. Patient empowerment can be done successfully by understanding of GDM and its consequences, intense learning, organized training, monitoring and evaluation. In this study, it was observed that the maternal and foetal adverse outcomes were much less in Study group than that of control group. The patient and their family members were able to perform blood sugar level themselves, keep records properly and were able to interpret the result. Through repeated coaching they came to know what action they will take to minimize hyperglycemia. After discharge from the hospital they were aware about self management of GDM and notice if there were any deviation and they reported accordingly that helped to adhere them properly to the management of GDM. So, effective patient empowerment strategy to manage GDM is unique and it reduces the complication of GDM which are evident in this study.

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