

Maternal and fetal outcome of diabetes and pregnancy using structured multidisciplinary team approach

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ABSTRACT

Gestational diabetes mellitus and pre-existing diabetes have been recognized as a risk factor for a number of adverse outcomes during pregnancy, including macrosomia, birth trauma and cesarean delivery. Maintaining good glycemic control is the key intervention for reducing the frequency and severity of complications related to diabetes in pregnancy. One of the best approaches is multidisciplinary management in treating high risk pregnant women with gestational diabetes or pre-existing diabetes. This recognition has led to establish multidisciplinary team management including endocrinologist, obstetrician, dietician and diabetic educators in National Diabetes and endocrine centre in Royal hospital in April 2016. The aim of this study was to assess the efficacy of a comprehensive and multidisciplinary diabetes and pregnancy clinic in reducing risk of maternal and fetal outcome. This is a retrospective analysis of the maternal and fetal outcome of high risk pregnant women with gestational diabetes or pre-existing diabetes requiring insulin who has been followed in a tertiary hospital, Royal hospital before and after establishing the multidisciplinary management. The primary outcome was a composite of reduce number of admission, number of cesarean delivery, Pre eclampsia, and neonatal complications, including macrosomia, intrauterine fetal deaths and shoulder dystocia. Maternal and fetal outcome indicators were compared with same age groups and similar characters at two time periods, one before the implementation in January 2014 to March 2016 and the other was following the initiation of this comprehensive multidisciplinary program in (April 2016-March 2017). A 233 patients were enrolled from January 2014 to March 2016 before the implementation and 373 patients were enrolled after initiation the multidisciplinary program from April 2016 to March 2017. Follow up results revealed significant reductions in several prespecified outcomes, including cesarean delivery, number of admission, macrosomia and shoulder dystocia. Overall rate of fetal and maternal complications showed a significant improvement. Implementing a structured comprehensive multidisciplinary team approach in management of diabetes in pregnancy has a positive impact on improving the maternal and fetal outcome.



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1. INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. GDM is a very common condition affecting up to 25% of all pregnancies [1]. Several maternal and fetal complications are associated with poorly controlled GDM or Pre-existing diabetes during pregnancy. These complications include increased perinatal mortality, macrosomia, birth trauma and need of cesarean delivery [2]. Obstetric management of the pregnancy with regular routine care and close follow-up of fetal well-being and growth are essential to avoid the fetal and maternal complications associated with Diabetes in Pregnancy [3], [4]. Implementing a structured comprehensive multidisciplinary team approach in management of diabetes in pregnancy was proven to be effective in delivering optimal maternal and fetal clinical outcomes [3].

2. Materials and methods

The multidisciplinary team included: Endocrinologists, diabetes educators, obstetricians, dieticians/nutritionists and psychologists.

2.1 Intervention

This is a retrospective analysis of the maternal and fetal outcome of high risk Omani pregnant women with gestational diabetes or pre-existing diabetes requiring insulin who has being followed in a tertiary hospital, Royal hospital before and after establishing the multidisciplinary management. The primary outcome was a composite of reduce number of admission, number of cesarean delivery, macrosomia, still birth or perinatal deaths and neonatal complications, including macrosomia and birth trauma. Maternal and fetal outcome indicators were compared with same age groups and similar characters at two time periods, one before the implementation in January 2014 to March 2016 and the other was following the initiation of this comprehensive multidisciplinary program in (April 2016-March 2017).

The inclusion criteria for data analysis included all Omani pregnant women diagnosed with high risk GDM or pre-existing diabetes requiring insulin who has being attending regularly more than three visits and delivered in Royal hospital. GDM treatment targets were adopted from the ADA standards of diabetes care.

3. Statistical analysis

Data were collected regarding the mode of delivery, number of admission and neonatal complications which were compared using SPSS to conduct a multivariate analysis of variants. Five dependent variables were examined (mode of delivery, number of admission, macrosomia and all neonatal and maternal complications) against one

Independent variable, which is the time period of January 2014 to March 2016 compared to April 2016 to March 2017, after initiation of multidisciplinary program. We tested the null hypothesis that no differences in the frequencies of maternal and neonatal complications will be observed between the two groups of patients treated in the mentioned time periods.

Pearson' chi square test was used to evaluate the difference in each dependent variable between the two time periods including the rate of cesarean sections, number of admission, macrosomia and shoulder dystocia.

4. Results

A total of 233 patients were enrolled from January 2014 to March 2016 before the implementation and 373 patients were enrolled after initiation the multidisciplinary program from April 2016 to March 2017. The demographics of each of the study groups are detailed in Table 1.

Follow up results revealed significant reductions in several prespecified outcomes, including cesarean delivery, number of admission, macrosomia and shoulder dystocia. Overall rate of fetal and maternal complications showed a significant improvement (Figs. 1–4).

After initiation of multidisciplinary program, the percentage of C/S was significantly lower ($P = 0.013$) and There were significantly reduced number of admission ($P = 0.017$) (Figs. 1–2).

There was a trend toward decreased incidence of intrauterine fetal deaths that was not significant ($P = 0.1$) (Figs. 5).

5. Discussion

The impact of implementing a structured comprehensive multidisciplinary team approach in management of diabetes in pregnancy in National diabetes and endocrine center in Royal hospital has a positive impact on improving the maternal and fetal outcome.

Table 1: Maternal Demographics of the study population

	January 2014 to March 2016	April 2016-March 2017
Age (years)	35±5	33±5
BMI	33.9±6	33±6
Initial Hbalc	6±1	6±3

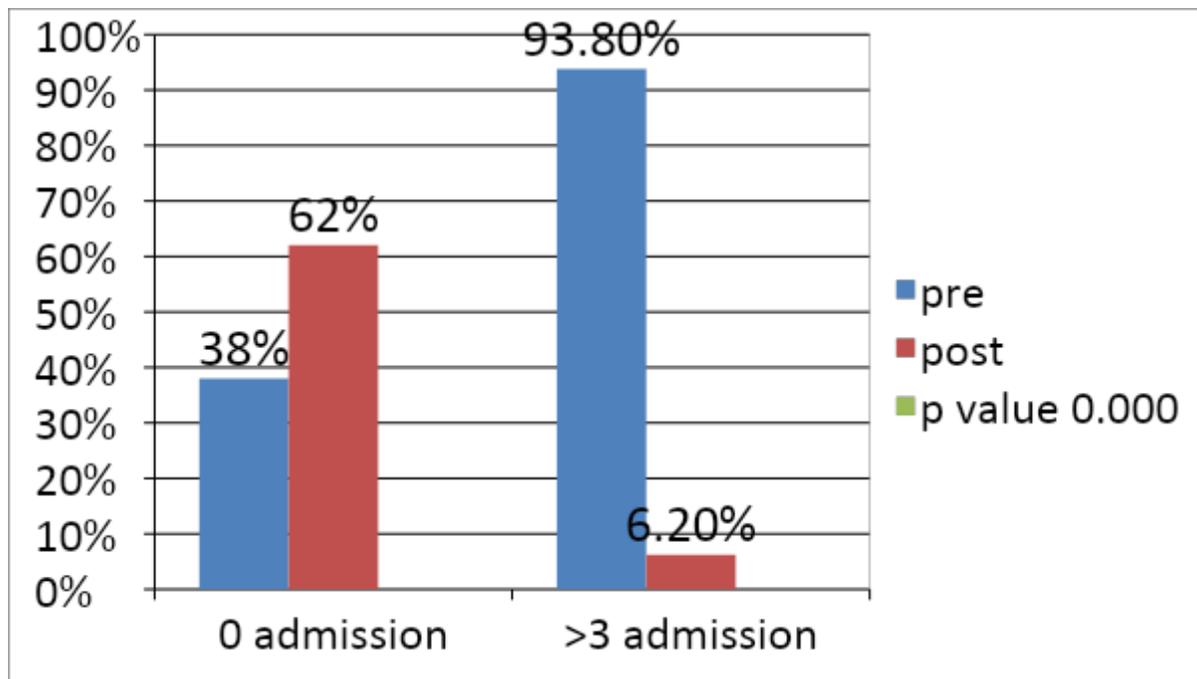


Fig.1. Number of admission

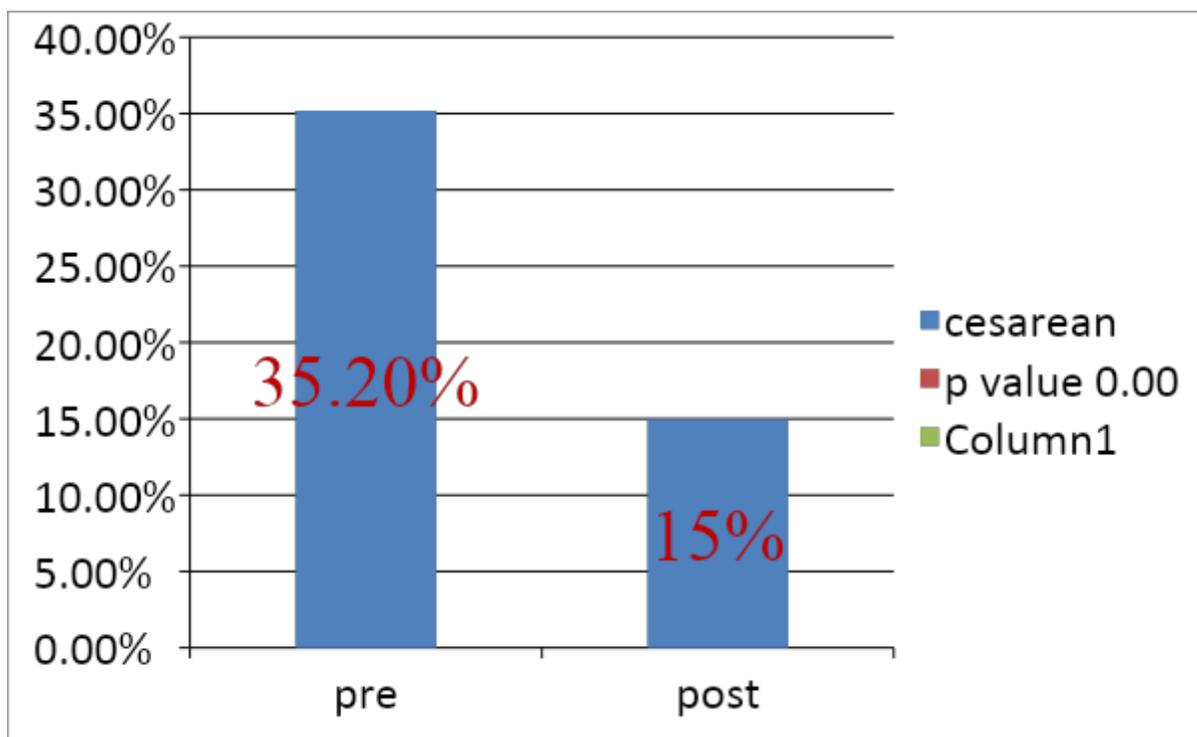


Fig.2. Mode of delivery, C-Section rate

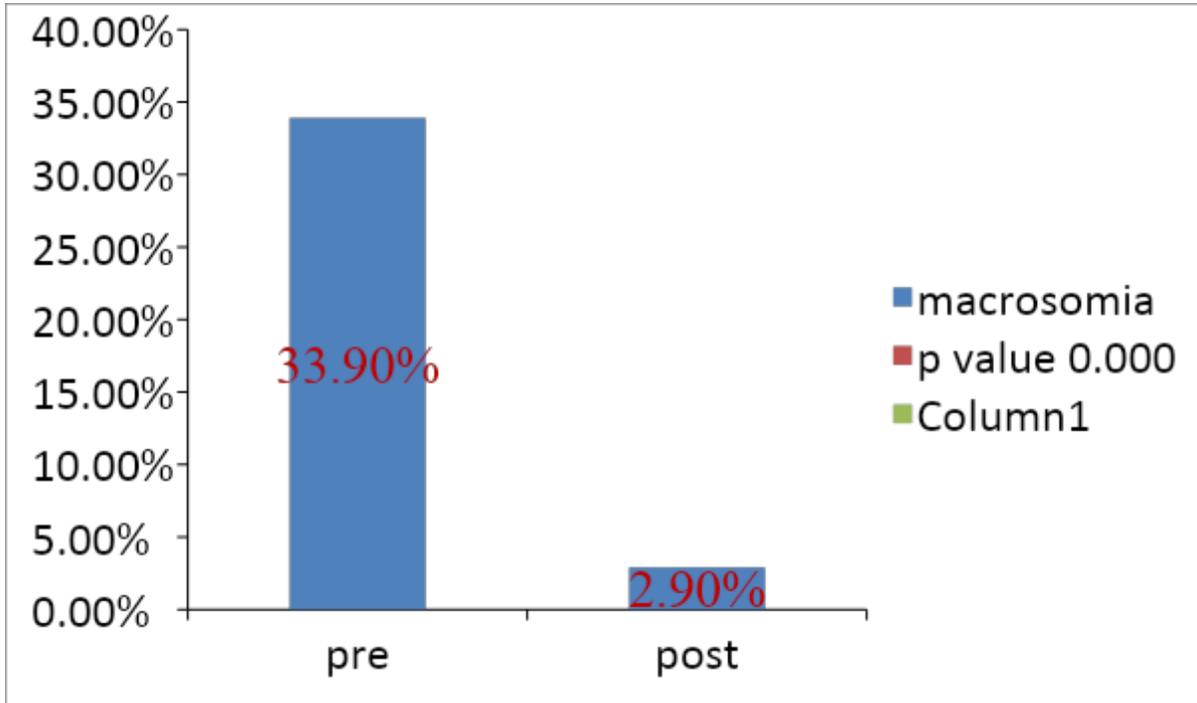


Fig.3. Percentage of neonatal macrosomia.

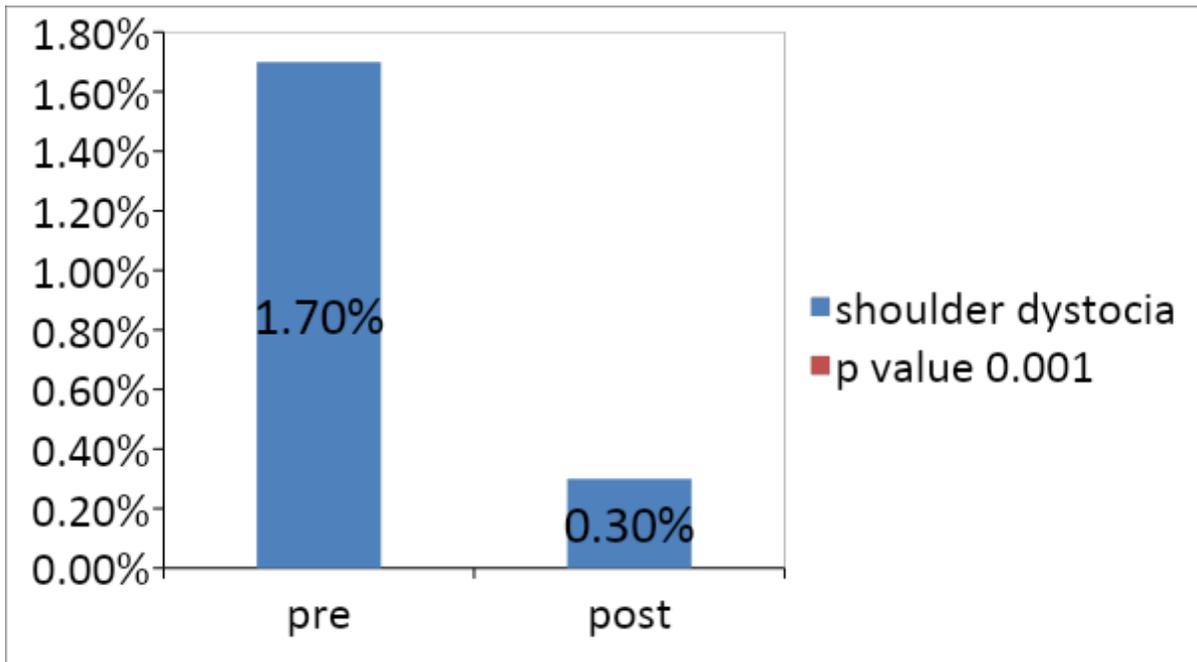


Fig.4. Percentage of neonates with shoulder dystocia.

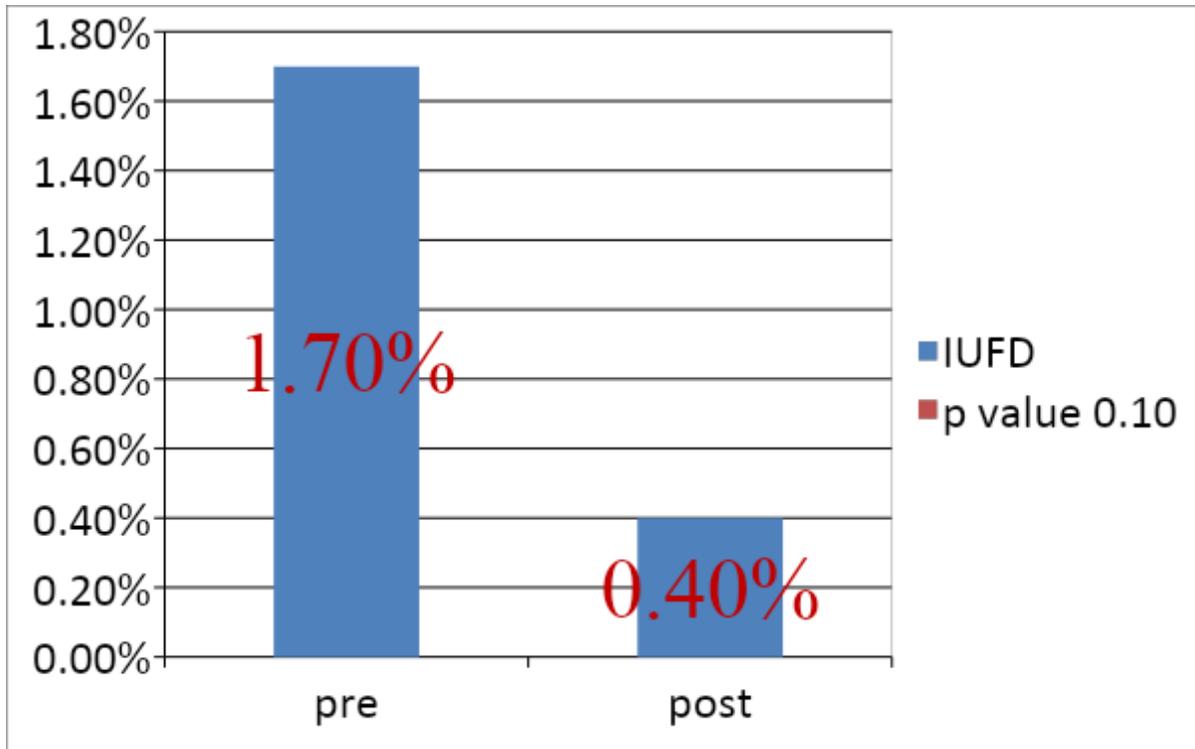


Fig.5. IUFD

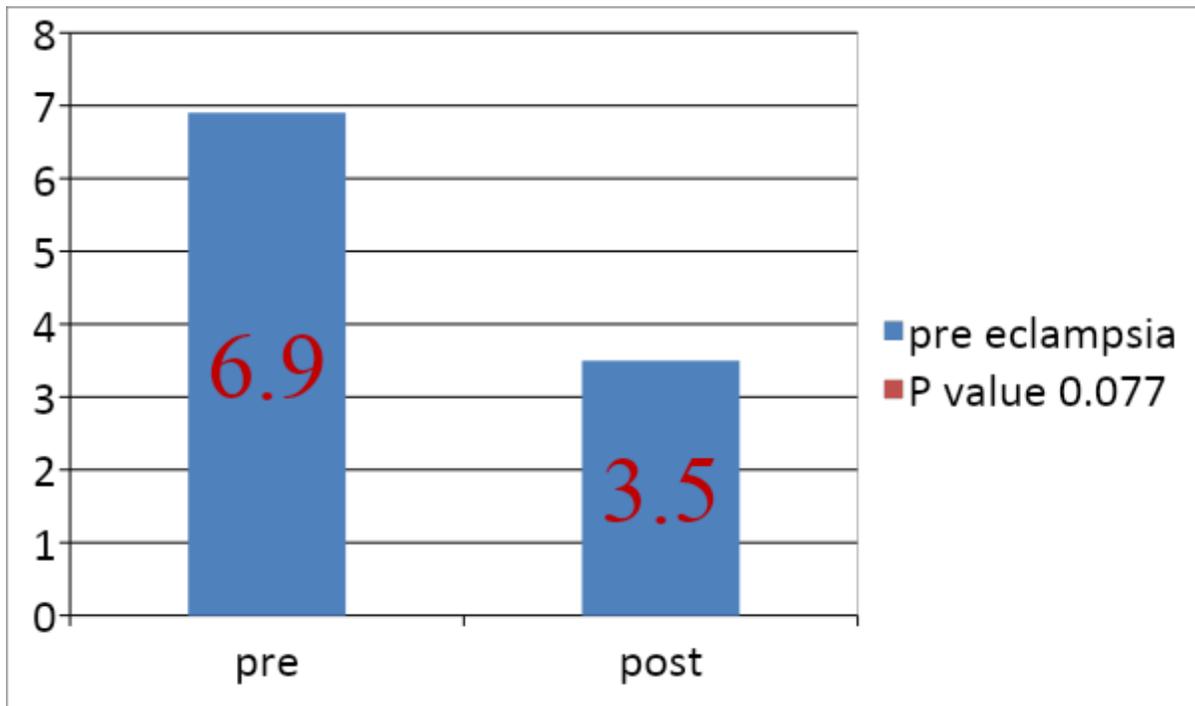


Fig.6. Pre eclampsia

6. Conclusion

Implementing a structured comprehensive multidisciplinary team approach in management of diabetes in pregnancy has a positive impact on improving the maternal and fetal outcome.

7. References

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