|| Print ISSN: 2589-7837 || Online ISSN: 2581-3935 ||
International Journal of Medical Science and Diagnosis Research (IJMSDR)
Available Online at www.ijmsdr.com
PubMed (National Library of Medicine ID: 101738825)
Volume 3, Issue 5; May: 2019; Page No. 110-114
Original Research Article
crossref DOI: https://dx.doi.org/10.32553/IJMSDR/v3i5.22

PREVELENCE OF DIABETIC RETINOPATHY IN PREGESTATIONAL TYPE 2 DIABETES – AN OBSEVATIONAL STUDY

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Conflicts of Interest: Nil

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Abstract:

AIMS: The aim of this observational study is to evaluate pattern and progression of diabetic retinopathy (DR) during pregnancy in females with pregestational type 2 diabetes mellitus (DM).

Method: This cross-sectional, population based study conducted at tertiary care centre, GMC Jammu on patients with pregestational DM. The study was done for 10 months from May 2017 to February. A total of 60 pregnant females with pregestational DM were included in study while those with gestational DM excluded from study. Ocular examination was done the fundus was examined with direct and indirect ophthalmoscopes, +90 D with slit lamp and fundal photography. Retinopathy was graded using the International Clinical Diabetic Retinopathy Disease Severity Scale (ICDRDSS). (Including fundus photography) and systemic assessment (including renal assessment and glycatedhaemoglobin) was done. DR was classified as: no apparent retinopathy (no DR), mild non-proliferative DR (mild NPDR), moderate NPDR, severe NPDR, proliferative DR (PDR) and diabetic macular oedema (DMO). Non-vision threatening DR (non-VTDR) included mild and moderate NPDR; VTDR included severe NPDR, PDR and DMO. Prevalence and progression of DR during pregnancy in the study cohort were the main outcome measures.

Results: Out of 60 patients of type 2 DM. On screening, 7 cases had nonproliferative DR (NPDR), and 1 had proliferative DR (PDR). During the study period, worsening observed in patient having PDR. Change in visual acuity observed in PDR patients but not in NPDR. No patient with NPDR converted to PDR. No new onset DR in the patients without DR at presentation. Assessment of risk factors for DR revealed significantly higher duration of DM.

Conclusion: No conversion from NPDR to PDR was observed. No new case of DRwas observed. Worsening of PDR case was observed. If any associated risk factor is present, careful monitoring during pregnancy required.

Keywords: Diabetes mellitus, pregnancy, diabetic retinopathy, pregestational diabetes

INTRODUCTION:

Deterioration of diabetic retinopathy during pregnancy takes place in women having pregestational diabetes mellitus (1,2,3). Multiple factors influence progression of DR including the pregnancy itself, glycemic control before and during pregnancy and presence of preexisting retinopathy (4,5). Maternal medical complications including diabetic nephropathy, pregnancy-induced hypertension and preeclampsia lead to progression of retinopathy (6,7). In spite of an overall increase in T2DM prevalence, there is decrease prevalence of DR, particularly vision threatening DR (VTDR), has been observed.(8)The decline could be consequence of increased care of patients with diabetes, early detection of T2DM and DR.(9) Duration of progression of diabetes(10), poor control of glycaemia,(11) blood pressure, (11) dyslipidaemia,(12) and higher levels of the urinary albumin to creatine ratio (UACR)(13) are known risk factors for onset and progression of DR. Hyperglycaemia plays a major role in this process,(14) and a strict glycaemic control is suggested, predominantly during the initial phases of the disease. In addition, the control of blood

pressure (15) and regular ocular fundus examinations are advised to reduce DR severity and incidence.

Material and method

Study design: This is observational study, conducted on 60 patients at GMC Jammu,Upgraded Department of Ophthalmology

Study period: 10 months from May 2017 to February.

INCLUSION CRITERIA.

1. Women having singleton pregnancies who gave informed consent were included.
2. Women having pregestational diabetes on the following basis: (1) an established diagnosis of type one or type two diabetes mellitus prior to conception or (2) glycosylated hemoglobin (HbA1c) greater than 6.5%[11]

EXCLUSION CRITERIA.

1. Women having gestational diabetes

2. Patients having type 1 DM

Methodology:

A total of 60 pregnant diabetic females were evaluated for the presence and progression of DR. These patients presented in eye OPD from the departments of obstetrics and gynecology, endocrinology, and ophthalmology. All patients had preexisting DM before the current pregnancy and patient having gestational DM were excluded from the study.

History was taken regarding age of onset of diabetes, blood pressure (systolic and diastolic), hemoglobin, glycated hemoglobin (HbA1c), renal function tests (blood urea and creatinine), proteinuria, fasting and postprandial blood glucose values were assessed for all females at presentation, monthly during each trimester upto 7 months of pregnancy,then fortnightly in last two months along with antenatal visits and 1 month postpartum . Following childbirth, fetal record also taken for birth weight, and for any fetal defects.

Ocular examination was done at presentation, during each trimester and 1 month postpartum. Visual acuity was noted by using Snellens chart and dilated fundus examination by direct,indirect ophthalmoscopy. Slit lamp biomicroscopy(with 90 D) and fundus photography were done for posterior segment evaluation. Dilatation of fundus was done with 1%tropicamide. DR and its progression were graded according to the early treatment of DR study classification. If the patient had proliferative DR (PDR), standard pan-retinal laser photocoagulation was undertaken promptly.

Grading of retinopathy was done as per international classification of DR. Progression was defined as at least one stage of deterioration of diabetic retinopathy and/or development of diabetic macular edema on at least one eye.

Assesment of DR classify as - no apparent retinopathy (no DR), mild non-proliferative DR (mild NPDR), moderate NPDR, severe NPDR, proliferative DR (PDR) and DMO. Each patient was given a DR according to the worst eye.

Kidney function tests including serum, creatine levels were assessed and determined as normoalbuminuria (UACR <30 mg/g), microalbuminuria (UACR 30–299 mg/g), and macroalbuminuria (UACR ≥300 mg/g).

Other clinical variables were : age at time of diagnosis of diabetes, duration of diabetes and glycatedhaemoglobin levels (A1C), total cholesterol, low density lipoprotein cholesterol, high density lipoprotein (HDL) cholesterol, triglycerides, non-HDL cholesterol, blood pressure (systolic and diastolic) and smoking status.

Results

In this study, 60 patients were enrolled having pregestational type 2 diabetes mellitus. Patients were followed prospectively. Out of 60 patients, 21 patients were primigravida. Twenty nine years of age found to be median age of conception and 5 years found to be mean duration of diabetes. Out of 60 pregestational diabetic patients, 8 patients (13.3%) found to have diabetic retinopathy. Five patients (8.3%) had mild DR, 1 patient (1.6%) moderate DR, 1 patient (1.6%) had severe DR and 1 patient (1.6%) had PDR. Overall prevelance of diabetic retinopathy in pregestational type 2 DM was 13.3% Incidence of vision threatening condition was 1.6% and non-vision threatening condition was 10.5% No new onset DR in the patients without DR at presentation.

Progression of diabetic retinopathy and visual outcomes

Eight patients were detected to have DR at presentation, out of which seven had nonproliferative DR (NPDR) and one patient had PDR. The disease showed bilaterality. Patients with PDR worsened during pregnancy but no worsening of disease was seen in patients having non-proliferative DR. Visual acuity in eyes with NPDR at initial and final follow-up remained while visual acuity showed worsening between initial and final follow-up in eyes with PDR. No spontaneous regression observed in any patient in one month postpartum.

Risk factors for diabetic retinopathy

The other factors associated with its progression include duration of diabetes, severity of retinopathy at conception, hyperglycaemic control, anaemia and development of coexisting hypertension. Due to increased risk of progression of the disease in pregnancy, conception should be delayed till the ocular disease is treated and stabilized.

Discussion

Worsening of DR during pregnancy is well documented in women with pregestational DM. In this study, worsening was seen in patients with PDR, whereas patients with NPDR remained stable. No patients having NPDR converted to PDR. Assessment of risk factors for DR revealed significantly higher duration of DM in patients with worsening of PDR during pregnancy. Higher diastolic blood pressure was found in the last trimester in patients with DR. Spontaneous resolution not noted in any of the patients.

Most of the previously done studies on progression of DR show high rates of progression of retinopathy.(8,9,11-15) not consistant with this study

In population of women with pregestational diabetes, we demonstrated that attendance at prepregnancy care was associated with receiving adequate retinal evaluation in the subsequent pregnancy. Despite tight glycemic control and antihypertensive therapy as required, progression of retinopathy was observed in 1patient only.

Recommendations for retinopathy screening and management in pregnancy vary significantly. The American Diabetes Association advises an eye examination in the first trimester with close follow-up throughout pregnancy. The National Institute for Health and Clinical Excellence (NICE) in the United Kingdom recommends retinal assessment following the first antenatal clinic appointment and again at 28 weeks if the first assessment is normal. If any diabetic retinopathy is present, an additional retinal assessment should be performed at 16–20 weeks. In this study, we did minimum of two retinal evaluations in separate trimesters.

This study conducted to see retinopathy progression during pregnancy particularly among women. Rasmussen et al. evaluated 80 patients with type two diabetes and observed progression in 14% (16), consistant with this study. Vestgaard et al. evaluated 102 women with type one diabetes and noted progression in 27% (17). While the third trimester HbA1c was similar between groups that did and did not progress in our study, the first trimester value was on average 0.5% high in the patient that developed retinopathy progression. The importance of prepregnancy glycemic optimization should be highlighted as it is associated with a tendency towards less progression of retinopathy compared with waiting until pregnancy is confirmed in type one diabetes (16, 18). In the setting of an unplanned pregnancy with poor glycemic control, tight glycemic control should be prioritized and appropriately optimized as the long-term consequences of poor glycemic control during the pregnancy lead to retinopathy progression (18,19). The association between retinopathy progression and systolic blood pressure also observed and higher systolic blood pressure negatively influence retinopathy (20).

In relation to the complication severity, one developed sight-threatening disease and women who developed sight-threatening disease had significant changes identified at baseline. These findings are reassuring, particularly as Hellstedt et al. demonstrated a regression of mild retinopathy postpartum in a cohort of women with type one diabetes (21). A limitation of the study is that we do not have postpartum evaluations to determine the longer-term progression of retinopathy. However,

Arun and Taylor studied women with type one diabetes for 5 years after delivery and concluded that pregnancy is not associated with postpartum worsening of retinopathy (19).

Conclusion

To summarize, pregnant females having PDR and those with long duration of preexisting DM should be carefully monitored during pregnancy. PDR should be treated as early as possible. Women continue to experience deterioration in retinopathy during pregnancy and this require close follow-up, the importance of prepregnancy care to fully inform women of the need for more frequent retinal assessments during pregnancy and allow preconceptual optimization of glycemic control and blood pressure. Provide high quality antenatal care for women with pregestational diabetes mellitus. The study had some limitation that the number of patients were less and post partum followup done in the study was less.

References

1. B. E. K. Klein, S. E.Moss, and R. Klein. Effect of pregnancy on progression of diabetic retinopathy. Diabetes Care 1990;13:34–40.
2. K. L. Rasmussen, C. S. Laugesen, L. Ringholm, M. Vestgaard, P. Damm, and E. R. Mathiesen. Progression of diabetic retinopathy during pregnancy in women with type 2 diabetes. Diabetologia 2010; 53:1076–1083.
3. Y. Omori, S. Minei, T. Testuo, K. Nemoto, M. Shimizu, and M. Sanaka.Current status of pregnancy in diabetic women.A comparison of pregnancy in IDDM and NIDDM mothers.Diabetes Research and Clinical Practice 1994; 24:S273–S278.
4. R. Hampshire, H. Wharton, R. Leigh, A. Wright, and P. Dodson. Screening for diabetic retinopathy in pregnancy using photographic review clinics. Diabetic Medicine 2013;30:475–477.
5. E. Y. Chew, J. L. Mills, B. E. Metzger et al., Metabolic control and progression of retinopathy. The Diabetes in Early Pregnancy Study.National Institute ofChildHealthandHuman Development Diabetes in Early Pregnancy Study. Diabetes Care 1995;18:631–637.
6. M. Vestgaard, L. Ringholm, C. S. Laugesen, K. L. Rasmussen, P. Damm, and E. R. Mathiesen. Pregnancy-induced sightthreatening diabetic retinopathy in women with Type 1 diabetes. Diabetic Medicine 2010;27:431–435.
7. M. L¨ovestam-Adrian, C. Agardh, A. Aberg, and E. Agardh. Pre-eclampsia is a potent risk factor for deterioration of retinopathy during pregnancy in type 1 diabetic patients. Diabetic Medicine 1997;14:1059–1065.
8. Romero-Aroca P, Fernández-Balart J, Baget-Bernaldiz M, et al. Changes in the diabetic retinopathy epidemiology after 14 years in a population of Type 1 and 2 diabetic patients after the new diabetes mellitus diagnosis criteria and a more strict control of the patients.. J Diabetes Complications 2009;23:229–38.
9. Wong TY, Mwamburi M, Klein R, et al. Rates of progression in diabetic retinopathy during different time periods: a systematic review and meta-analysis. Diabetes Care 2009;32:2307–13.
10. Fong DS, Aiello L, Gardner TW, et al. American Diabetes Association. Retinopathy in diabetes. Diabetes Care 2004;27(Suppl 1):S84–7.
11. Stratton IM, Kohner EM, Aldington SJ, et al. UKPDS 50: risk factors for incidence and progression of retinopathy in Type II diabetes over 6 years from diagnosis. Diabetologia 2001;44:156–63.
12. Chew EY, Ambrosius WT, Davis MD, et al. Effects of medical therapies on retinopathy progression in type 2 diabetes. N Engl J Med 2010;363:233–44.
13. Lunetta M, Infantone L, Calogero AE, et al. Increased urinary albumin excretion is a marker of risk for retinopathy and coronary heart disease in patients with type 2 diabetes mellitus. Diabetes Res Clin Pract1998;40:45–51.
14. Hemmingsen B, Lund SS, Gluud C, et al. Targeting intensive glycaemic control versus targeting conventional glycaemic control for type 2 diabetes mellitus. Cochrane Database Syst Rev2013;11:CD008143.
15. K. L. Rasmussen, C. S. Laugesen, L. Ringholm, M. Vestgaard, P. Damm, and E. R. Mathiesen.

Progression of diabetic retinopathy during pregnancy in women with type 2 diabetes. Diabetologia 2010;53:1076–1083, 2010.

16. M. Vestgaard, L. Ringholm, C. S. Laugesen, K. L. Rasmussen, P. Damm, and E. R. Mathiesen. Pregnancy-induced sight-threatening diabetic retinopathy in women with Type 1 diabetes. Diabetic Medicine 2010;27:431–435.

17. The Diabetes Control and Complications Trial Research Group. Effect of pregnancy on microvascular complications in the diabetes control and complications trial. Diabetes Care 2000;23:1084–1091.

18. C. S. Arun and R. Taylor. Influence of pregnancy on long-term progression of retinopathy in patients with type 1 diabetes. Diabetologia 2008;51:1041–1045.

19. R. Axer-Siegel, M. Hod, S. Fink-Cohen et al., Diabetic retinopathy during pregnancy. Ophthalmology 1996;103:1815–1819.

20. T. Hellstedt, R. Kaaja, K. Teramo, and I. Immonen. The effect of pregnancy on mild diabetic retinopathy.Graefe's Archive for Clinical and Experimental Ophthalmology 1997; 235:437–441.