Research Paper

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Retinopathic Complications Associated with Fibro Calculous Pancreatic Diabetes Patients

Medical Science

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ABSTRACT

The study was on Fibro-Calculous Pancreatic Diabetes (FCPD), which is a subset of Malnutrition Related Diabetes Mellitus and secondary to Tropical Calcific Pancreatitis having multifactorial aetiology, involving both environmental and ethnic factors. We had selected rural areas with mixed socio economic condition for our study, that was the rural areas of gangetic plane of the district of Purba Medinipur West Bengal. At first we confirmed our subjects if they were FCPD affected or not. Due to insufficient information was available in the literature on retinal involvement found from fundoscopic and fluorescein angiographic studies, some of our FCPD patients were subjected to these tests, to have an idea about the degree of injury made by this disease and to compare with other subsets of diabetes. Retinal involvement of our subjects was not very different from other types of diabetes.

Introduction

FCPD is an uncommon cause of diabetes, characterized by chronic pancreatitis of unknown origin and presence of large intraductal pancreatic stones. It is a subset of Malnutrition Related Diabetes Mellitus (MRDM)[1]. There was dirth of information on the prevalence of this disease in West Bengal and its clearcut aetiology was not yet fully established, though there was an almost generalized agreement on the pathological changes of pancreas in FCPD. The aetiology of FCDP was likely to be multifactorial, involving both environmental and genetic factors, but their roles were still largely unexplained[2]. Respective reports from different states of India vary to achieve any inference[3,4]. Retinopathy means pathological changes in retina. Diabetes can affect the eye in many ways. Usually it involves the fine network of blood vessels in the retina - hence its name, Diabetic Retinopathy[5]. Here we concentrate only in the retinal changes as well as involvement of micro vascular complications in our identified subjects.

Criteria For Selection Of FCPD Patients.

(According to WHO (1985) and Mohon)6,7,8

1. Occurrence in a tropical country.
2. Diabetes: by WHO (1985) criteria

a) Onset within 10-30 years of age.
b) Body Mass Index (BMI) less than 19Kg/M2
c) Ketosis resistance under adverse conditions.
d) Insulin requirement more than 2 Units/Kg/Day.
e) Poor socio-economic conditions and a definite history of childhood malnutrition.

3. Evidence of chronic pancreatitis: pancreatic calculi on X-ray or at least three of the following:

a. Abnormal pancreatic morphology by sonography or CT scan.
b. Chronic abdominal pain.
c. Steatorrhoea.
d. Abnormal pancreatic functional test.

4. Absence of other causes of chronic pancreatitis, i.e., alcoholism, hepatobiliary disease or primary hyper parathyroidism etc.

Long Term Hyperglycemia Offers The Following Changes To Eye:

A. Refractive changes:

More presbyopic at younger age Incorrectable blurring of vision.

B. Floccular cataracts :

Especially in insulin dependents Showers of small granular opacities Higher rate of progression.

C. Glaucoma:

Higher frequency of chronic open angle neovascular glaucoma.

D. Retinopathy:

Functional and structural changes in retinal capillaries. Those are manifested in four clinical disease stages: Background(BDR), Pre-proliferative(PPDR), Proliferative(PDR) and Quiescent Diabetic Retinopathy (QDR).

Aims and Objectives

- To make a full comprehensive study dealing with the aspect of microvascular changes in FCPD.
- To find the comparison with the micro vascular complication pattern of other subsets of diabetes mellitus.
- To have an idea about the degree of injury in retina made by this disease.

Methods

The patients were subjected to opthalmoscopy and fluorescein angiography to detect and categorize retinal involvement. Diabetic retinopathy was classified in accordance with Fukuda's clinical classification[9] as follows:-

Level 0: No retinopathy.

Level 1: Microaneurism only (A I)

Level 2: Microaneurism with retinal haemorrhage.(A II).

Level 3: Preproliferative retinopathy (soft exudates, increased capillary occlusion and intaretinal microvascular abnormalities – IRMAs) (B I).

Level 4: Neovascularization elsewhwere (B II).

Level 5: Neovascularization elsewhwere (B III).

Level 6: Vitreous haemorrahage or proliferative (B IV, V).

Observations

Opthalmoscopic studies reveal that 60% of the FCPD patients have retinopathy compared to 68.75% of Type I and 57.15% of Type II patients. Preproliferative retinopathy is most common among all the retinal complications where as neovascularization is less common than Type I and Type II diabetes.

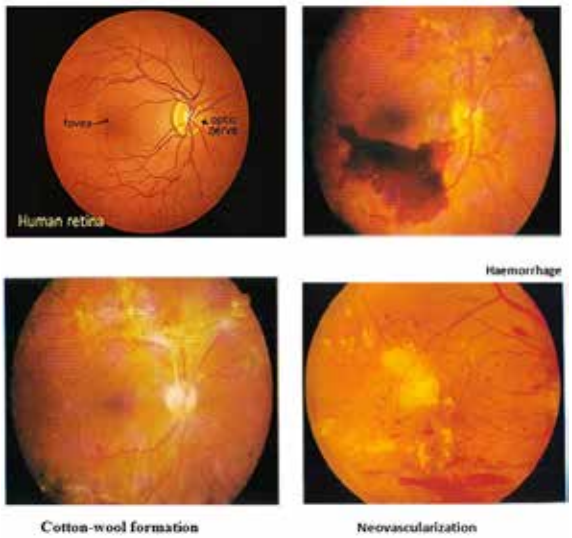

Table Retinal changes of FCPD, Type I and II diabetic patients

Level of diabetic retinopathy	FCPD (n=20)		Type I (n=16)		Type II (n=14)	
	n	(%)	n	(%)	n	(%)
Level (0)	8	(40)	5	(31.25)	6	(42.85)
Level 1 (AI)	4	(20)	4	(25.00)	3	(21.43)
Level 2 (AII)	2	(10)	2	(12.50)	1	(8.50)
Level 3 (BI)	5	(25)	2	(12.50)	2	(14.80)
Level 4 (B II)	1	(5)	1	(6.25)	1	(8.50)
Level 5 (B III)	-	-	1	(6.25)	1	(8.50)
Level 6 (BIV,V)	-	-	1	(6.25)	-	-

Discussion

Retinopathy is most common among the microvascular complications of diabetes. It is a common cause of blindness in the developed countries. The risk of blindness among the diabetics is 12-20 times greater than the non-diabetes. Kahn et al[10] have observed that the prevalence of retinopathy is related to age when diabetes is present for less than 10 years. The duration of diabetes is thought to exert a much greater influence on the prevalence of retinopathy. Since many of our patients had diabetes for more than 5 years, we examined them for clinical evidence of retinopathy and compared the result with matched Type I and non-obese Type II diabetes. Table shows that 60% of the FCPD patients studied had retinopathy compared to 68.75% of the Type I and 57.15% of the type II cases. The occurrence of level1 and level 2 retinopathy (Fukuda's Classification) is comparable, although the occurrence of level 3 retinopathy is more common in FCPD where level 4 retinopathy is more common in the primary forms. Diabetic microvascular complications were previously believed to be rare and mild in FCPD, as in other secondary forms of diabetes. However, recent studies revealed that the prevalence of such complications is comparable to the primary forms. Mohan et al[11] have shows that both the sight-threatening forms of retinopathy, namely proliferative retinopathy and maculopathy occur in FCPD patients. Yajnik et al[12] also reported that diabetic tissue damage like neuropathy, retinopathy and nephropathy are as common in FCPD as in primary forms of diabetics. These results are as our belief, unlike other forms of secondary diabetics, retinal involvement in FCPD is comparable to the primary forms of diabetes and so these patients need similar ocular surveillance.

In a large study at the Joslin clinic, Rand et al[13] studied the effect of HLA antigens on the development of proliferative retinopathy. They compared a group of patients with proliferative retinopathy and with a group without such lesions after 26 years of diabetes. They found that HLA- DR4 and especially HLA- DR3 were associated with a high frequency of preproliferative retinopathy, the odds ratio for the later being 3.74. Since 79.27% of patients were $DR3^+$ so this may explain the high occurence rate of preproliferative retinopathy in FCPD patients (25% in FCPD patients compared to 12.5% in Type I and 14.8% in Type II diabetics).

Conclusion

The study showed the retinal involvement in FCPD was not very different from type I and need similar ocular surveillance.The other microvascular complications like nephropathy and neuropathy were also at least as common in FCPD as in other primary forms. High degree of HLA-DR3 association of the patients under study may explain the high occurrence of pre-proliferative retinopathy.

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