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Case Series

A study on fibro-calculous pancreatic diabetes conducted in a tertiary medical institution in Northern Bihar

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ABSTRACT

Fibro-calculous pancreatic diabetes (FCPD), which is seen in tropical areas and is caused by idiopathic nonalcoholic chronic pancreatitis, is characterized by pancreatic calcification and stomach pain. One female patient and nine male patients were identified as having FCPD. Half of the patients were under 30 years old, with an average age of 28.44±7.07. Seven individuals had diabetes for a shorter period of time than five years. Four patients reported with problems related to various infections, while six patients had osmotic complaints due to uncontrolled diabetes. With a mean waist-hip ratio of 0.89 and a mean BMI of 19.42, all of the patients were thinly built. With mean FBS of 231 mg/dl, PPBS of 469 mg/dl, and HbA1c of 11.96, all patients had uncontrolled diabetes. Microvascular issues affected 30% of the patients, while none of the patients experienced macrovascular complications. A rare type of secondary diabetes called FCPD is becoming more widespread in northern states like Bihar.

Keywords: Fibro-calculous, Diabetes, Pancreatic, Secondary

INTRODUCTION

Fibro-calculous pancreatic diabetes (FCPD) is a distinct kind of diabetes that arises from idiopathic nonalcoholic chronic pancreatitis and is typically prevalent in tropical regions of the world. It is characterized by pancreatic calcification and abdominal pain. It mostly affects those with low socioeconomic level who are undernourished and have a low body mass index (low BMI).[1,2] This kind of diabetes is extremely fragile, frequently insulin-dependent, and highly challenging to control. Patient had a history of steatorrhea and recurring abdominal pain from childhood. By end of early adulthood, the diabetes started to develop. Pancreatic calculus is present in radiological analyses, either with/without atrophied pancreas.

The southern state of Kerala in India reports the most cases, followed by Tamil Nadu, Orissa, and Karnataka. A few case reports from different states, including Delhi, Maharashtra, Tripura, and Andhra, were also included. A study conducted in Chennai found that the general population's prevalence of FCPD was 0.019 percent.[3]

Etiopathogenesis of FCPD is not properly defined yet. There are several postulated hypotheses which includes malnutrition, Casava diet, oxidative stress, autoimmunity and genetic factors.[4-11]

Over the past few decades, there has been a notable shift in the clinical, biochemical, and demographic characteristics of patients with FCPD. The study's goals are to evaluate the clinical, biochemical, and demographic profiles of FCPD patients attending a peripheral medical college in the northern region of Bihar and to assess whether there has been a shift in the disease's secular patterns.

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The diagnosis of FCPD was made based on the criteria, proposed by Mohan et al.[12] The following were the diagnosing criteria (Table 1).

Table 1: Diagnostic criteria of FCPD.

S. no.	Diagnostic criteria
1	Patient should originate from tropical country
2	Diabetes should be present
3	Evidence of chronic pancreatic calculi on abdominal X-ray/ at least three of following, such as-abnormal pancreatic morphology on sonography/CT scan, recurrent abdominal pain since childhood, steatorrhea, abnormal pancreatic function tests,
4	Absence of other causes of chronic pancreatitis

Ten patients were identified as having FCPD, of which one (10%) was female and the other ninety percent were male. Twenty percent of patients are between the ages of 39 and 49, forty percent are between the ages of 28 and 38, and forty percent of patients are between the ages of 17 and 27. The age distribution is 28.44±7.07.

Clinical history

Thirty percent of the patients had diabetes for more than five years, while seventy percent had had the disease for less than five years. Twenty percent of the patients had a family history of diabetes, while the remaining eighty percent did not. Only one person (10%) reported a history of infrequent, insignificant alcohol consumption. None of the patients had previously consumed cassava.

Associated conditions

Of the patients, 60% had osmotic symptoms and other complaints associated with uncontrolled diabetes, while the remaining 40% had problems linked to infections (e.g., COVID, UTI, TB, pneumonia).

Anthropometric characteristics

The mean BMI was 19.42 and 20% of the patients had low BMIs (<18.5 kg/m^2). Ratio of mean waist to hip was 0.89. The average skinfold thickness of the triceps was 9 mm, whereas the subscapular skinfold measured 10.6 mm (Table 2).

Table 2: Anthropometric features of FCPD patients.

Parameters	Mean ± SD
BMI (kg/m^2)	19.42±1.28
Waist hip ratio	0.89±0.02
Triceps skin fold (mm)	9±1.2
Subscapular skin fold (mm)	10.6±3.4

Other biochemical markers and glucose control

The mean FBS and PPBS were 231 and 469 mg/dl, respectively. The HbA1c mean was 11.96. The relative mean values for LDL, triglycerides, and total cholesterol were 77.30, 142.50, and 180.80. ACR was 27.23 and creatinine was 0.87 on average (Table 3). Every patient needed insulin, and those who were discharged with sufficient glycemic control needed an average of 0.8 IU/kg of insulin.

Table 3: Lipid profile and renal status of FCPD patients.

Parameters	Mean ± SD
Total cholesterol	180.80±22.35
Triglycerides	142.50±29.98
LDL	77.30±11.26
Creatinine	0.87±0.22
ACR	27.23±2.51

Complications associated with diabetes

Of the ten patients, one developed neuropathy, one with retinopathy and nephropathy both, and one patient of only nephropathy. There were no macrovascular problems in any of the individuals. None of the patients experienced diabetic ketoacidosis, despite the fact that one patient had ketone bodies detected in the urine.

DISCUSSION

The purpose of this study was to assess the clinical, biochemical, and demographic characteristics of patients with FCPD who were attended to a tertiary care facility in the northern region of Bihar.

The majority of study participants were male, with an average age of 28.44±7.07 years. Since males predominate and the presenting age in FCPD has traditionally been reported as being between 10 and 40 years old, the mean age of our group likewise aligns with that finding.[12]

With 20% of patients having low BMI, the mean ± SD for BMI was 19.42. The WHR mean was 0.89. The mean BMI of the 55 patients in Yajnik and Shelgikar's 1993 study with FCPD patients was 17 kg/m^2, and 58% of the patients had low BMIs (<18 kg/m^2).[13] The significant dietary and socioeconomic improvements that FCPD patients have had over the past three decades are often likely responsible for this change in their body habits. Mean HbA1c found in our participants was 11.96 in contrast to 10.6 by Yajnik and Shelgikar.[13]

Three individuals (30%) in our patient have experienced different microvascular problems (nephropathy, retinopathy, neuropathy). One patient in particular had both retinopathy and nephropathy. One (10%) person had neuropathy and one (10%) had only diabetic nephropathy. There were no macrovascular problems in any of the

individuals (CAD, PVD). In research by Levitt and colleagues, patients with pancreatic diabetes who had a mean duration of 8 years of diabetes had 23 percent nephropathy and 33.3 percent retinopathy.[14]

Thirteen out of forty patients (32.5%) with FCPD had some type of diabetic retinopathy, according to a study.[15] In another different study, Mohan et al found that patients with FCPD had retinopathy (30.1%), PVD (4.7%), neuropathy (20.9%), and nephropathy (10.1%). However, there was no discernible difference in the development of microvascular complications between FCPD patients and those with type 2 diabetes.[16] Our study revealed a significantly reduced number of diabetes-related complications due to a lower participant number and a shorter mean duration (4.4 years) of diabetes.

CONCLUSION

Only tropical nations are home to FCPD, a type of secondary diabetes. Although it originated in southern India, northern states like Bihar are also seeing a rise in its prevalence. In lean and young patients with uncontrolled diabetes of insidious onset without ketosis, FCPD should be taken into consideration rather than being immediately classified as type 1 diabetes. To check for pancreatic calcifications in all such instances, a USG abdomen should be obtained. Since it is an extremely brittle form of diabetes, management frequently requires early insulin therapy. Nonetheless, because of socioeconomic advancement and better nutrition, the prognosis for FCPD patients has improved, and over time, notable changes have been observed with regard to clinical, demographic, and biochemical characteristics.

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