

# Does Fibrocalculous Pancreatic Diabetes Exist in Our Region- A Study in Diabetic Patients at Shaikh Zayed Hospital, Lahore

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## SUMMARY

Diabetes mellitus seen in Tropical Calcific Pancreatitis (TCP) is called Fibrocalculous Pancreatic Diabetes (FCPD). The aim of the study was to examine the prevalence of FCPD in our region by screening the patients with diabetes mellitus presenting to our hospital. One hundred patients attending the diabetic clinic at Shaikh Zayed Hospital were included in the study irrespective of type of diabetes. Plain abdominal x-rays were obtained. Patients with pancreatic calcification on abdominal x-rays having no history of alcoholism or family history of chronic pancreatitis were classified as FCPD. Eighty eight patients had non-insulin dependent diabetes mellitus (NIDDM) and 12 had insulin dependent diabetes (IDDM). Among 100 patients only one patient was found to have FCPD. She developed diabetes at the age of 24 years and was recently shifted to insulin due to poor diabetic control. She did not give history of recurrent upper abdominal pain or steatorrhea. Her body mass index was 15.55 kg/m<sup>2</sup>. We conclude that FCPD is rare in our study. A community-based study is required to determine its true prevalence in our population.

## INTRODUCTION

**T**ropical Calcific Pancreatitis (TCP) is a form of chronic pancreatitis seen in tropical and developing countries<sup>1-3</sup>. It is generally a disease of youth and early adulthood. Over 90% of patients develop the illness prior to the age of 40 years<sup>4</sup>. The youngest age described is 3 years<sup>5</sup>. Patients present with recurrent abdominal pain, severe malnutrition, and exocrine or endocrine pancreatic insufficiency<sup>6,7</sup>. Steatorrhea is rare owing to a generally very low fat intake. There is a male predominance<sup>6</sup>. The chronic pancreatitis causes progressive beta-cell deficiency, leading to insulin-requiring diabetes during the 2nd or 3rd decade<sup>8</sup>. Diabetes occurs in about 70% cases of TCP<sup>9</sup>. According to 1985 WHO classification, diabetes in TCP is labeled as Fibrocalculous Pancreatic Diabetes (FCPD)<sup>10</sup>.

The etiology of TCP is obscure<sup>11, 12</sup>. Certain environmental factors such as long history of malnutrition<sup>13</sup>, consumption of cassava (containing

cyanogenic glycosides injurious to pancreas)<sup>14,15</sup>, and deficiencies of vitamin C, beta-carotene, zinc, copper, magnesium and selenium<sup>6</sup>, have been suggested. However, TCP is also seen in patients from higher economic levels, in which malnutrition is unlikely<sup>16</sup>. In studies from India<sup>17</sup> and others countries<sup>18,19</sup> no correlation was found between consumption of cassava and the frequency of TCP<sup>20-22</sup>. The early age of onset and variable familial aggregation suggest the presence of genetic factors<sup>23, 24</sup>. Environmental factors possibly operate on the background of a genetic predisposition to pancreatitis<sup>7</sup>. Recently, mutations in SPINK1 gene have been reported to be associated with TCP<sup>23, 25, 26</sup>.

TCP is characterized by large intraductal calculi, marked dilation of the main pancreatic duct, and gland atrophy. The major component of these calculi is calcium carbonate<sup>27</sup>.

TCP is endemic in South India<sup>28</sup>. It has been reported from a number of other areas, including Africa, Southeast Asia, and even Brazil.

There is no data available about the prevalence of TCP in Pakistan. The aim of our study

was to determine the proportion of diabetic patients having FCPD in our population.

### PATIENTS AND METHODS

We prospectively selected 100 patients attending the diabetic clinic at Shaikh Zayed Hospital, Lahore between February and May 2003. Ninety three patients were on regular follow up at the clinic while 7 were new entries. Diabetes mellitus was diagnosed using WHO 1985 criteria.

All patients underwent a history and physical examination. Patients were asked about recurrent upper abdominal pain radiating to back, and getting better with sitting and leaning forward. Age of onset of diabetes and treatment with oral hypoglycemic drugs and/or insulin were noted. All patients denied alcohol intake or family history of chronic pancreatitis and none gave a history suggestive of malnutrition during childhood. Socioeconomic status of patients was grouped into classes as: Class 1- have savings beyond daily living expenditures, class 2- can meet daily living but can not save, and class 3- can not meet daily living. Body mass index (BMI) of each patient was recorded. All patients belonged to Lahore and adjoining districts.

Plain abdominal x-rays in erect posture were obtained to look for pancreatic calcification. X-ray reporting was done by consultant radiologists.

Informed consent was obtained from all subjects and the study was approved by the institutional ethics committee.

SPSS 10 software (SPSS Inc., Chicago, IL) was used to determine the frequency of FCPD among 100 patients included in the study. Clinical characteristics of patients with FCPD were reported as frequency / percentages for maximal variables and Mean  $\pm$  SD for numerical data.

### RESULTS

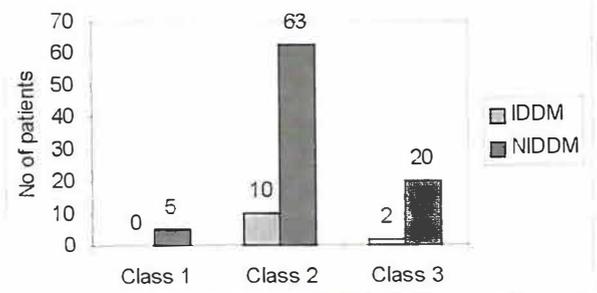
The demographic characteristics of patients included in the study are given in Table 1. Eighty eight percent patients were suffering from non-insulin dependent diabetes mellitus (NIDDM) and 12% had insulin dependent diabetes (IDDM). Female patients outnumbered males in both types of diabetes.

Table 1: Demographic characteristic

	IDDM	NIDDM
Number	12 (12%)	88 (88%)
Sex (M/F)	4/8 (33.7/66.7%)	36/52 (40.9/59.1%)
Mean age (Years)	23.83 $\pm$ 5.49	44.06 $\pm$ 9.32
Mean BMI (Kg/m <sup>2</sup> )	24.81 $\pm$ 6.97	26.69 $\pm$ 4.81

No patient gave history of steatorrhea. Nine patients (10.2%) of NIDDM group had recurrent upper abdominal pain which increased after meals and associated with indigestion and flatulence. Among these, 3 patients admitted radiation of pain to back but all denied association of pain with posture. Seven patients in IDDM group (58.3%) and 47 in NIDDM group (53.4%) had family history of diabetes mellitus. Number of patients of both types of diabetes in three socioeconomic classes is shown in Figure 1.

Figure 1: Socioeconomic class and the type of diabetes mellitus



Among 100 patients only one was found to have pancreatic calcification. She was 28 years old lady who was diagnosed to have diabetes at the age of 24. Her diabetes had been controlled previously with dietary measures and oral hypoglycemic drugs but recently she was prescribed insulin due to deteriorating diabetic control. She had no history of recurrent upper abdominal pain or steatorrhea. She has no first-degree relative with diabetes or chronic pancreatitis. She denied any history suggestive of malnutrition during childhood. Her body mass index was 15.55 kg/m<sup>2</sup>.

## DISCUSSION

We examined the prevalence of FCPD among diabetic patients at Shaikh Zayed Hospital, Lahore. FCPD results from progressive impairment of beta cell function in patients with TCP. It is associated with an advanced stage of the disease<sup>19</sup>.

TCP is seen in tropical countries and is endemic in South India<sup>28</sup>. A recent field survey in Kerala, South India, showed an overall prevalence of 0.12%<sup>2</sup>. In endemic areas 5-30% of the patients with diabetes below age 30 years have FCPD<sup>11, 19</sup>. We rarely see patients with TCP and it is evident from our finding that only one patient had FCPD among 100 patients we studied.

Environmental factors such as protein energy malnutrition, consumption of various foods and deficiencies of trace elements have been postulated as the causative factors in TCP<sup>6, 13, 14</sup>. Recently, a strong association has been found between the N34S mutation of SPINK1 gene and TCP with or without diabetes<sup>7</sup>. A similar genetic predisposition has been found in idiopathic chronic pancreatitis seen in industrialized countries<sup>7</sup>.

TCP starts at a young age<sup>4</sup>. Patients present with recurrent abdominal pain and malnutrition<sup>6</sup>. There is progressive endocrine insufficiency leading to diabetes during 2nd or 3rd decade of life<sup>8</sup>. Our patient developed diabetes at the age of 24 years and had BMI of 15.55 kg/m<sup>2</sup>. This is consistent with what is known previously. On the other hand she did not have any history of recurrent abdominal pain which is a typical feature of TCP.

## CONCLUSION

FCPD is rare in our population. A larger community-based study is required to screen enough patients with FCPD to describe various characters of the disease and to assess its true prevalence in our region.

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