



## Changing Demography of Pancreatitis Patients in India – A Hospital Based Study

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### Abstract

Pancreatitis is a disease of inflammation of the pancreas and is rising exponentially in the world. Different causes are attributed to the disease with alcohol, tobacco and family history as the major causes. However, its etiology largely remains unknown. It is reported that the Southern states of India have highest incidences of Pancreatitis, ranging from 114-200/100,000 population. Rest of the globe reports 1.6-27 cases per 100,000 populations. A North India based ayurvedic clinic has collected details of age, sex, religion, caste, profession, native place, dietary habits and family history from 800 well-diagnosed patients of Recurrent Acute/Chronic Pancreatitis (RA/CP), enrolled from January 1997 to June 2019. Surprisingly, patients from the Northern states of India outnumber those from the Southern states. Similarly, incidences of Pancreatitis were significantly higher among non-alcoholics, non-tobacco users and those with no previous family history. The male-female ratio was 4.6:1. Highest incidences were noted in the age group of nineteen to forty five years. Interestingly, highest cases of Pancreatitis were reported among the service class and students. A comprehensive survey needs to be carried to understand the magnitude of Pancreatitis in this region. An emphasis should also be made to explore more etiological factors.

**Keywords:** Pancreatitis; Recurrent; Acute; Demography

### Introduction

Pancreatitis, the inflammatory disorder of the pancreas, is characterized by moderate to severe abdominal pain, nausea, vomiting, indigestion, weight loss and steatorrhea, affecting individual's personal, professional and social life [1]. The first case of Acute Pancreatitis (AP) was reported in year 1652 by Dutch anatomist Nicholas Tulp [2]. Later, Reginald Fitz, a pathologist from Harvard, in 1889, established the diagnosis of Acute Pancreatitis by specifying its signs and symptoms [3]. Hans Chiari of Austria related Pancreatitis to auto-digestion of pancreatic tissues (1896). Chronic Pancreatitis (CP) was ascribed in 1946 by Comfort, an American anatomist, who also highlighted its possible causes [4].

Henceforth, there has been a rising trend in the incidences of Pancreatitis across the world. The incidences of Acute Pancreatitis in Wales, UK rose from 27.6 per 100,000 populations in 1999 to 35.9 in 2010 with an annual increase of 2.7% per annum [5]. A nationwide hospital based study in Columbus recorded a 13.3% rise in Acute Pancreatitis related admissions from 2002-05 to 2009-12 [6]. A field study carried in 1993 in Kerala, a Southern state of India, reported highest incidences of tropical Chronic Pancreatitis in the world (up to 126 per 100,000 population) [7].

Chronic Pancreatitis also showed rising trend from 2.94 in 1977-86 to 4.35 in 1997-2000 per 100,000 populations in a population based study in Olmsted County [8]. The trend was also reported from China where prevalence of CP rose from 3.1/100,000 in 1996 to 13.5/100,000 population in 2003 [9]. Similarly, high prevalence of tropical Chronic Pancreatitis has been reported from Southern India (114-200/100,000 populations) in 2004 [10]. Japan carried seven nationwide surveys between 1994 to 2011 regarding the epidemiology of Pancreatitis and demonstrated increasing prevalence of CP from 28.5/100,000 in 1994 to 52.4/100,000 in 2011 [9]. A South India based tertiary care centre reported 13.3% rise from 2000-06 to 2007-13 [11]. Global Burden of Disease study of 2015 has reported 8.9 million cases of Pancreatitis in the world with 132,700 deaths [12].

Alcohol is considered the most common cause of CP/AP other than gall stones and genetic or environmental factors. However, there are fair number of cases who have never consumed alcohol in their lifetime. But there is no doubt that alcohol increases the sensitivity of the pancreas and the risk of Pancreatitis is undoubtedly high among alcoholics. Similarly, the risk of Pancreatitis was observed to be higher among smokers in comparison to non-smokers

but could not be attributed as the cause of CP/AP [13]. The role of dietary factors in the etiology of Pancreatitis is still unclear. Heredity is also a causative factor of Pancreatitis and such patients could be placed among high risk of developing pancreatic cancer, ranging from 40-55%. The disease is more common among men and affects middle aged individuals the most. In recent years, there are reports about its increasing trend in paediatric population as well [13].

The presented study was carried to understand the various aspects of Pancreatitis.

### Methodology

A North India based hospital, practicing Ayurveda, has been receiving patients of different variants of Pancreatitis since 1997 [14]. Fifty cases were enrolled from 1997 to 2013. However, the number increased multi-fold owing to a public event held in 2014 in the presence of policy makers, professionals, scientists and media. Till date, 800 patients have been enrolled at this clinic. All these patients had been diagnosed by the subject experts at distinguished hospitals for different variants of Pancreatitis (Figure 1a) belonging to both sexes (Figure 1b) from age group ranging from 3 to 72 years with a mean age of  $30.07 \pm 11.3$  years (Figure 1c) and had a history of disease ranging from 1 month to 25 years (Figure 1d). These patients were interviewed for the onset of symptoms, diagnostic hospitals, emergency attacks/hospitalizations and use of enzymes, along with their personal profile including dietary habits, native place, education, profession and family history. A baseline blood investigations, consisting of hemogram, lipid, liver, kidney and diabetic profile, Serum Amylase, Lipase, Vitamin B12 and D3 were carried to understand the status of the patient prior to the commencement of Ayurvedic treatment. A detailed data of these patients regarding their age, native place, food habits, education, profession and family history was collected at enrolment.

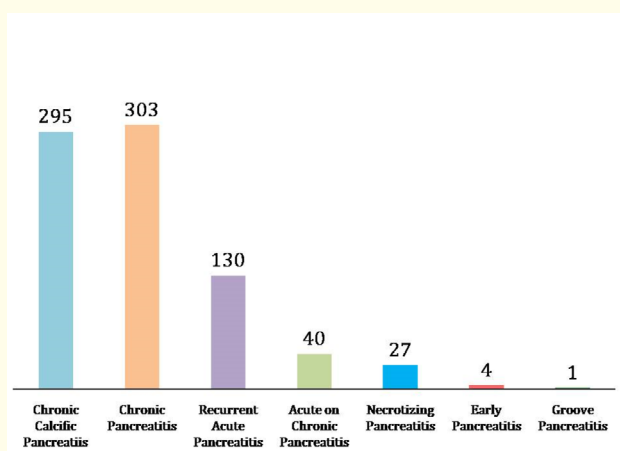


Figure 1a

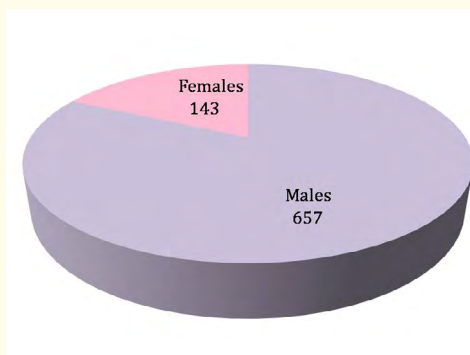


Figure 1b

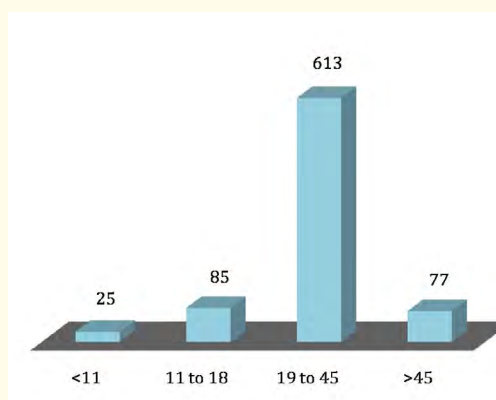


Figure 1c

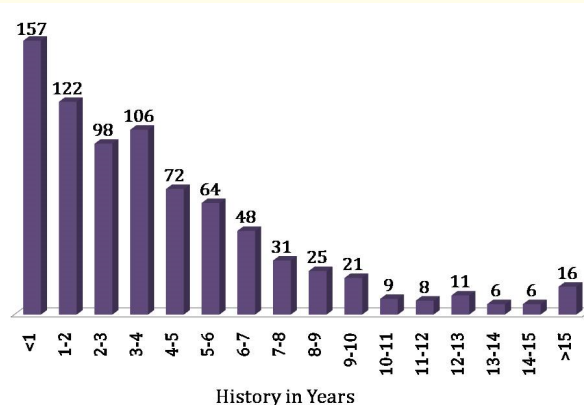
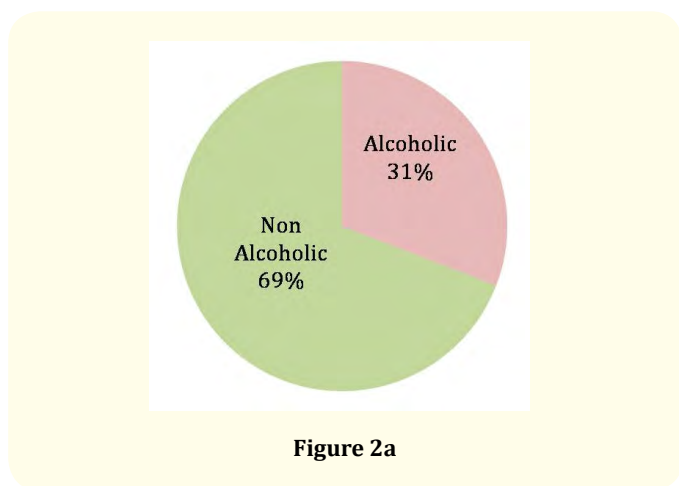
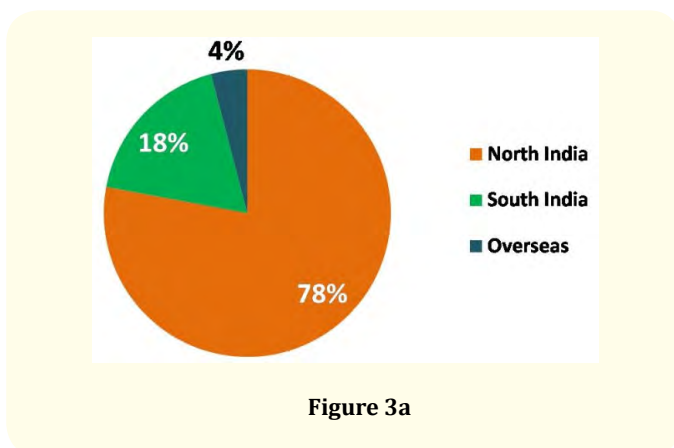


Figure 1d

### Outcomes

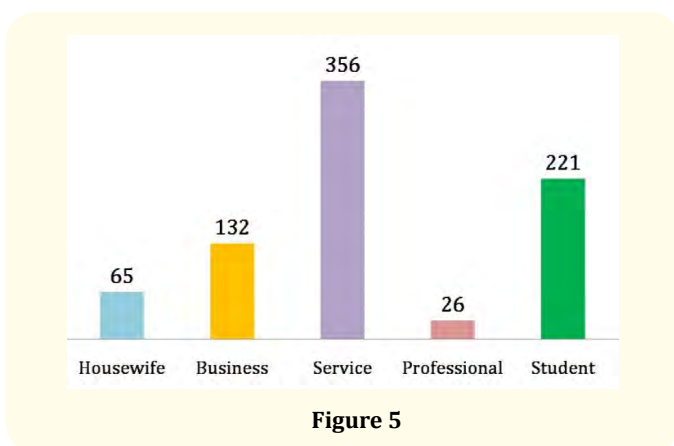
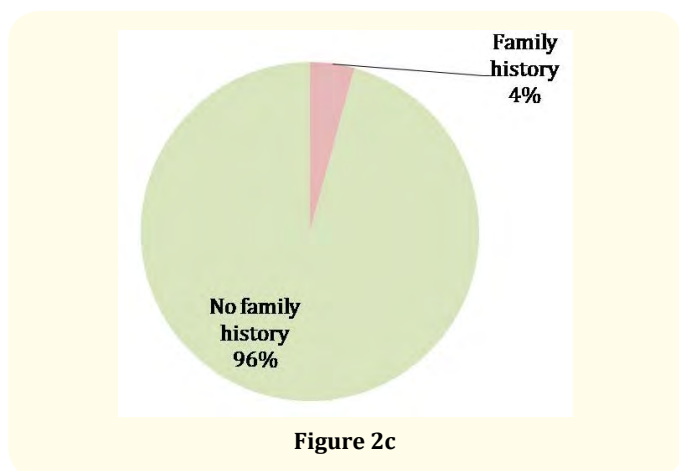
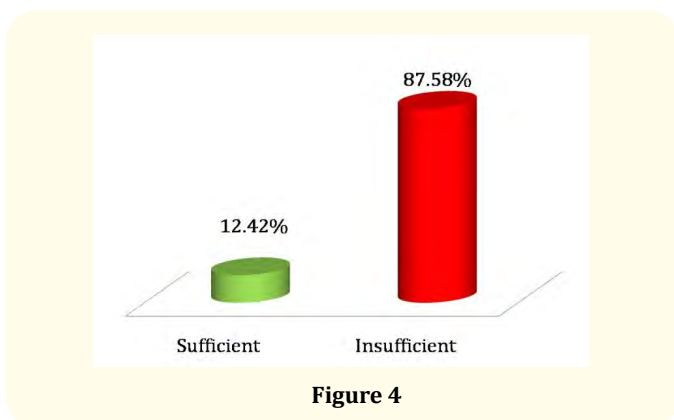
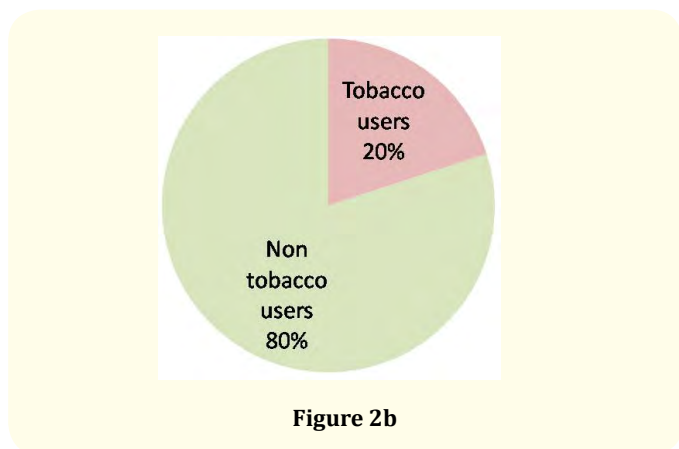
- Incidences linked with risk factors:** It was found that incidences of RA/CP are more prevalent among non alcoholics (69%), non tobacco users (80%) and those with no family history (96%) (Figure 2 a, b, c).

- **Geographical distribution:** North India reports higher incidences of RA/CP in comparison to South India (Figure 3 a, b). These observations might be non-conclusive but one thing is evident that incidences RA/CP are widely distributed in the country.
- Vitamin D deficiency: 87.58% patients were found to be deficient in Vitamin D3 (n=404/800) (Figure 4).
- Profession and education wise distribution: The incidences were more prevalent among service class and students (Figure 5). Maximum number of patients were from engineering background.



Uttar Pradesh	122	Andhra Pradesh	20
Maharashtra	69	Assam	18
Delhi	68	Tamil Nadu	16
Karnataka	59	Bihar	16
Gujarat	51	J & K	8
Uttarakhand	47	Odisha	8
Haryana	47	Himachal Pradesh	7
Rajasthan	37	Jharkhand	5
Madhya Pradesh	32	Tripura	2
Telangana	31	Goa	2
West Bengal	27	Lakshadweep	1
Kerala	24	Sikkim	1
Chhattisgarh	24	Chandigarh	1
Punjab	23	Overseas	34

**Figure 3b**



## Discussion

Pancreatitis, which was first reported in seventeenth century, now affects nearly 0.15% of the world population with high morbidity rate. 55% patients die within 20 years of diagnosis [15]. Alcohol, tobacco and genetic factors have been identified for aggravating RA/CP. However, no confirmatory causative factor is yet established. The disease has rising trend and incidences are being reported from various parts of the world.

In the present study, a physician of Ayurvedic medicine (Complementary and Alternative Medicine) situated 250 kms north east from New Delhi has reported demography of its 800 patients, spread over 22 years duration. The observation brings some interesting findings as incidences are reported more among non-alcoholic and non-tobacco users and those with no family history. This is the first study of its type where RA/CP patients from North India outnumber South Indian patients. One may state that this number could be due to the presence of the clinic in North India. However, the second highest number of patients come from Maharashtra, which is far away from this clinic, nulling the aforesaid statement. The results clearly indicate that the incidences of RA/CP are spread all over the country. The findings also bring interesting information about professional and educational background of patients. The high incidences in service class and students might be indicative of a linkage between stress and RA/CP.

The study is in equivalence to the earlier studies that state that the incidences are more common in males and in productive age group [16]. However, there are rising cases of paediatric Pancreatitis [13]. The study does not draw any conclusion but might create a pathway for mapping of Indian population for the incidences of RA/CP and developing hypothesis for a causative factor.

## Conclusion

The incidences of RA/CP are rising in India and are not restricted to one region only. The disease should be understood well to reduce their burden on individuals and their families.

## Acknowledgement

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## Conflict of Interest

Authors declare no conflict of interest.

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