



## Prevalence and type of biliary stones in India

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### PREVALENCE AND TYPE OF BILIARY STONES IN INDIA

Since it is known generally in the western world that gallbladder stones are uncommon in Asia Pacific region, and the primary bile duct stones (oriental cholangitis) are common, we undertook a systematic study at our center in Northern India to find out the prevalence of gallstones as well as the type of stones in the gallbladder and in the bile duct.

#### GALLBLADDER STONES

A gallstones survey limited to railroad workers conducted in 1966 utilizing oral cholecystography had suggested that gallbladder stones occurred 7 times more commonly in North Indian workers than in South Indian workers<sup>[1]</sup>. This difference was attributed to the different ethnic background of the workers. Delhi, being a cosmopolitan city, has inhabitants from different parts of the country living often in colonies comprised mostly of their own ethnic groups. This provided us an excellent opportunity to study the prevalence of gallstones in different ethnic groups. Thus, we performed a community study in four different colonies of Delhi, each with inhabitants belonging to a specific ethnic group (Table 1). The study comprised a short clinical history and examination, a dietary history on a pre-formed questionnaire and an abdominal ultrasound

examination. Of a total of 1104 subjects examined, 48 (4.3%) were found to have gallbladder stones<sup>[2]</sup>. This prevalence is about half of that in the western world (10%). The most interesting feature, however, was that the gallstone prevalences varied tremendously between our different ethnic groups, the highest being in Punjabis (North Indians) and the lowest in South Indians (Table 1). Besides ethnic influence, dietary differences might also be responsible for this wide variation in gallstone prevalence. However, the number of subjects studied and the design of this study did not permit us to differentiate between these two etiological factors.

We then, embarked on another study to determine the composition of gallstones and the type of gallstones from different parts of the country. We obtained gallstones from consecutive patients undergoing cholecystectomy at four different centers, three from North India (New Delhi, Jaipur and Patna) and two from South India (Chennai and Kerala). Cholesterol gallstones were defined as those which contained more than 50% of their dry weight as cholesterol and pigment gallstones were defined as those containing less than 20% of their dry weight as cholesterol. Using this definition we found a striking difference in the types of gallstones obtained from the two regions. Those from North India were predominantly cholesterol and those from South India were predominantly pigment gallstones<sup>[3]</sup> (Figure 1). The reason for this striking difference in the type of gallstones in the two regions is not clear, but again may be due to dietary differences or genetic predisposition. There was no significant difference between the ages of gallstone patients from South India and North India.

#### COMMON BILE DUCT (CBD) STONES

To study the chemical composition of CBD stones in patients from different parts of the country, we obtained CBD stones collected at operation from consecutive patients. Thus, CBD stones from 62 patients were obtained from a South Indian center and from 74 patients belonging to a North Indian center. They were divided into 2 groups, Group I consisting of those who had stones in their gallbladder or had undergone cholecystectomy earlier, and Group II of those who did not have stones in the gallbladder. All consecutive patients with CBD stones at one center in North India (New Delhi) and one center in South India (Chennai) were studied. The stones were chemically analyzed after retrieval. Those containing more than 50% of their dry weight as cholesterol were labeled as cholesterol stones. Others were labeled as bilirubinate stones. The results are shown in Table 2. The difference between South India and North India in terms of cholesterol vs pigment stones in the gallbladder seen above is reflected again in CBD stones. It also reiterates the fact that CBD stones originate from the gallbladder and then migrate to CBD in most patients with stones in the gallbladder<sup>[4]</sup>. On the other hand, in patients who did not have stones in the gallbladder (Group II), the CBD stones were presumed to have formed *de novo* in the CBD, i.e. primary CBD stones. Such stones are classically described as being bilirubinate stones. They were found in 90% of South Indians in our study. However, in 78% of North Indian

**Table 1 Gallstone prevalence in 4 different communities in New Delhi n%**

Community	n	GS prevalence No.
Punjabi	203	15 (7.4)
Gujaratis	142	6 (7.4)
Bengalis	545	24 (4.4)
South Indians	214	4 (1.8)

n = Number of subjects studied.

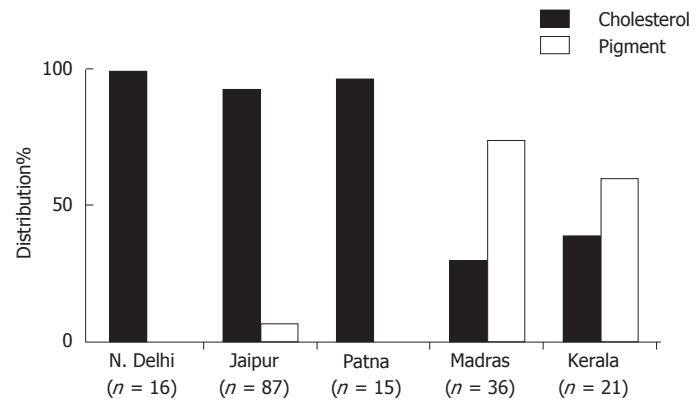
**Table 2 Cholesterol vs bilirubinate CBD stones in different regions of India n%**

	South Indian Center		North Indian Center	
	Group I	Group II	Group I	Group II
Cholesterol	10 (47)	4 (10)	54 (96)	14 (78)
Pigment	11 (53)	37 (90)	2 (4)	4 (22)

patients in CBD stones retrieved were predominantly of cholesterol type (Table 2). This suggests that in North Indians either most stones are cholesterol rich whether formed in the gallbladder or bile duct. It is not unusual for a single stone in the gallbladder to migrate to the CBD giving a false impression of primary CBD stone rather than having had its origin in the gallbladder<sup>[4]</sup>.

## CONCLUSION

The prevalence of gallbladder stones varies widely in different communities in India, the North Indians having 2-4 fold higher prevalence as compared with those among South Indians. Furthermore, there is a predominance of cholesterol gallstones among the North Indians and that is reflected both in the gallbladder as well as CBD stone analysis, including the CBD stones

**Figure 1 Geographic distribution of cholesterol vs pigment gallstones in India (n = 175).**

not accompanied by a demonstrable stone in the gallbladder. In contrast, South Indians have a predominance of pigment gallstones both in the gallbladder and the CBD.

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