

# Prevalence of Gallstone Disease in Mexico

## A Necropsy Study

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*The prevalence of gallstone disease in Mexico was investigated by studying a sample of 21,446 necropsies performed at the Department of Pathology of the General Hospital of Mexico City during a 35-year period (1953-1988). For each decade, 1000 necropsy cases were randomly selected. The crude prevalence of gallstone disease was 14.3%, 8.5% for males and 20.4% for females. The age groups ranged from 20 to more than 80 years old; the age-standardized prevalence for males was 5.6% and for females 16.2%. These rates are intermediate between those found in Chile and some African countries, comparable to some European studies, and less than those found in Mexican-Americans. No significant trend in the prevalence of gallstone disease was found when the different decades were compared.*

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**KEY WORDS:** epidemiology; cholelithiasis; autopsy; Mexico.

Since the prevalence of gallstone disease (GD) varies widely throughout the world, it is unwise to assume that the frequency of gallstones is similar among racially homogeneous populations that live in nearby geographic areas. Moreover, prevalence rates for GD differ even between populations that live in the same country and that are similar in their racial and cultural backgrounds (1). In the American continent, cholelithiasis is one of the leading causes of disease among North American Indians (2), in Chile (3), and in Bolivia (4). In the United States, a higher prevalence of GD has been reported

for Mexican-Americans (5); in this population, the prevalence is higher than that found in other Hispanic groups (6). In Mexico, a high frequency of GD has been previously recognized (7). However, since statistical data has not been reported, we decided to perform an autopsy study to determine the prevalence of GD among the low-income population that seeks medical care in a large general hospital located in Mexico City. In addition, the study was designed to explore whether prevalence rates of GD have changed during the last decades.

### MATERIALS AND METHODS

This study was carried out at the Department of Pathology of the General Hospital of Mexico City. This hospital is a 1200-bed medical facility that provides care mainly for low-income individuals from Mexico City and rural areas who lack all types of medical insurance. The number of necropsies performed between 1953 and 1988 was 21,446, representing 40-60% of the hospital deaths. A sample of 1000 cases was selected for each decade using a random numbers table. From the necropsy records, sex, age, and associated diseases were recorded. GD was defined as the presence of gallstones in the

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gallbladder and/or biliary ducts, or as the absence of a gallbladder as a result of prior cholecystectomy. Cholesterolosis was not included in this analysis. The prevalences for each decade were also compared. These results and those obtained in other series were standardized for age with the direct method (8) using a standard population for Mexico (9). For statistical comparisons, age-specific groups were analyzed by the chi-square method.

### RESULTS

Of the total cases with GD, only six (1.04%) had undergone prior cholecystectomy. The overall female to male ratio in the sample was 0.9:1 (1941/2059). GD was present in 14.3% (572/4000) of all subjects over 20 years of age. For women, the crude prevalence of GD was 20.4% (397/1941), and 8.5% (175/2059) for men, with an overall sex ratio of 1.6:1. GD was greater in women than in men in each age group, being highest among individuals over 60 years of age (Table 1). For women, the age group most affected was those older than 80 years (45.07%), and for men of those between 70 and 80 years (15.38%) (Table 1).

The crude prevalence of GD showed an increase in the last decade (15.8%) when compared with the 1950s (12.2%) but is similar to that obtained for the 1960s (Table 2). The age-standardized prevalence of GD in men was 5.6% versus 16.2% in women. A comparative analysis of the rates with those derived from similar necropsy studies performed in other countries is shown in Figure 1.

### DISCUSSION

The main limitations of necropsy studies are the low autopsy rates in many hospitals, and the fact that deaths followed by necropsy represent only a select group of all deaths occurring among hospitalized persons. However, such studies provide valuable data for detecting changes in GD prevalence over periods of time, or for comparative studies

TABLE 1. PREVALENCE OF GALLSTONE DISEASE IN MEXICO BY AGE GROUPS AND SEX

| Age group | Sex      |       |          |       | Total    | %     |
|-----------|----------|-------|----------|-------|----------|-------|
|           | Male     | %     | Female   | %     |          |       |
| 20-29     | 4/310    | 1.29  | 31/279   | 11.11 | 35/589   | 5.94  |
| 30-39     | 21/390   | 5.38  | 44/350   | 12.57 | 65/740   | 8.78  |
| 40-49     | 33/453   | 7.28  | 79/395   | 20.00 | 112/848  | 13.20 |
| 50-59     | 36/353   | 10.19 | 76/352   | 21.59 | 112/705  | 15.88 |
| 60-69     | 48/334   | 14.37 | 83/311   | 26.68 | 131/645  | 20.31 |
| 70-79     | 26/170   | 15.38 | 52/183   | 28.41 | 78/353   | 22.09 |
| >80       | 7/43     | 14.28 | 32/71    | 45.07 | 39/120   | 32.50 |
| Total     | 175/2059 | 8.49  | 397/1941 | 20.45 | 572/4000 | 14.30 |

TABLE 2. PREVALENCE OF GALLSTONE DISEASE IN MEXICO (1953-1988)\*

| Years     | Necropsies | With GD | M/F     | Ratio | Prevalence (%) |
|-----------|------------|---------|---------|-------|----------------|
| 1953-1959 | 1000       | 122     | 43/79   | 1:1.8 | 12.2           |
| 1960-1969 | 1000       | 155     | 49/106  | 1:2   | 15.5           |
| 1970-1979 | 1000       | 137     | 45/92   | 1:2   | 13.7           |
| 1980-1988 | 1000       | 158     | 38/120  | 1:3   | 15.8           |
| Total     | 4000       | 572     | 175/397 | 1:2   | 14.3           |

\*GD = gallstone disease; M/F = male/female.

between populations, since they satisfy the two conditions that must be met to estimate the prevalence rate of a disease from autopsy material: (1) the disease in question should not be a major contributor to the death of the patients, and (2) the selection of patients for autopsy should be independent of the presence of the disease. GD fulfills both requirements since gallstones rarely lead directly to death and the majority are asymptomatic. The prevalence of GD found in this study is intermediate between the high rates reported in Chile and the low rates found in some African countries, and resembles those derived from autopsy studies performed in some European countries (Figure 1). At variance with what has been demonstrated in other countries (10-13), a trend in the prevalence of GD was not found. However, for men and women, the prevalence reported in this study is lower than the ultrasound-determined prevalence of 23.2% and 7.2% found in Mexican-American women and men, respectively (6). Although these differences may be due to variations in the survey method and the selection of the population, two recent reports have shown the validity and, thus, comparability of epidemiological necropsy studies by demonstrating reasonable similar rates of GD to those obtained by ultrasonographic screening of large general populations (14, 15). A genetic predisposition to GD has been suggested by other studies performed in Mexican-American individuals (16); even after controlling for other risk factors, the probability of developing GD is greater in this population (17). Compared to non-Hispanic whites in the United States, increased levels of triglycerides and decreased concentration of high density lipoproteins have been found in Mexican-Americans (18). Interestingly, the prevalence of coronary heart disease has been persistently low in the autopsied population used in this study. It is possible that the higher prevalence of GD in Mexican-Americans than in Mexicans results from changes in life patterns of the

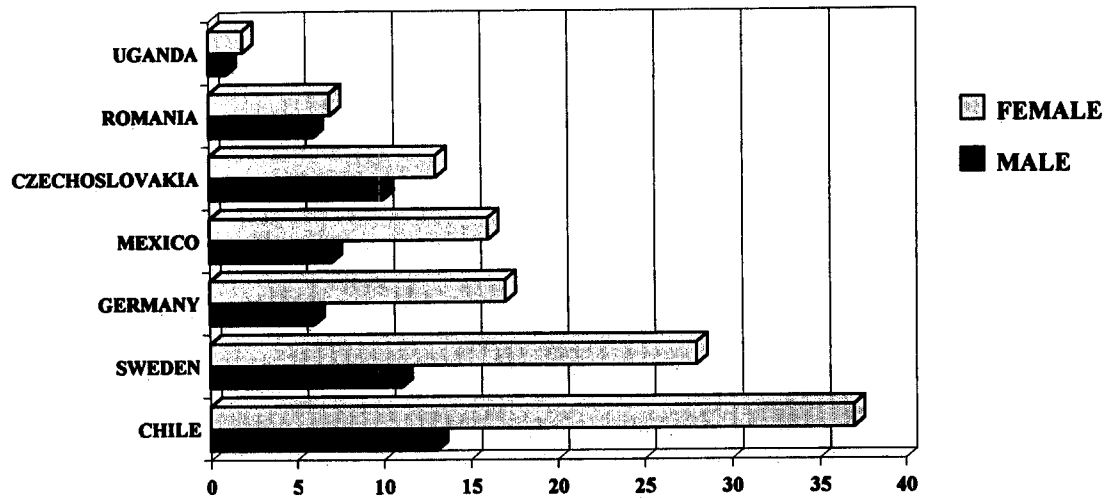


Fig 1. Age-standardized prevalence of gallstone disease in selected countries (autopsy studies).

migrating population that conform to those of the predominant culture. The epidemiology of GD in Mexican-Americans might represent a generational cohort phenomenon such that the prevalence increases with each generation in a genetically susceptible group as they improve their living standards. Although this is an attractive hypothesis, clinical gallbladder disease prevalence appears to be inversely related to socioeconomic status (19). Comparative prospective epidemiologic studies of both populations are needed to examine the relationship of changing habits and socioeconomic correlates to the prevalence of GD in genetically comparable individuals. We recently reported some clinical conditions associated with GD in Mexico: a family history of gallstones was found in 45.5% of the patients, obesity in 34.5%, and use of oral contraceptives in 33.3% (20). In countries such as Israel, where the prevalence of GD is lower than in Mexico, a family history of GD was found in 19% of the patients (21). By contrast, in countries with a higher prevalence of GD, this association may be found in 75% of the patients (22). The increase of GD with advancing age demonstrated in this and other studies may be due to a series of age-related factors such as abnormalities in the motor function of the gallbladder, stasis secondary to a reduction in food intake, or endocrine changes. However, an increase in a linear fashion with advancing age is expected with a condition such as GD that does not disappear spontaneously (23).

The economic impact of GD in Mexico is high. Nearly 150,000 cholecystectomies are performed

yearly (24). It has been calculated that more than \$250 million dollars are spent to treat GD each year in Mexico (25). If the population estimates for 1991 are accurate, more than 43 million persons are older than 20 years (9), and about 6 million have GD. Undoubtedly, more epidemiologic studies are needed to identify the modifiable environmental factors that influence its appearance. Such information is essential to develop measures to prevent this common and expensive disease.

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