

# GALLBLADDER DISEASE IN PUERTO RICO\*

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THIS STUDY is based on an analysis of 950 autopsies done by the Department of Pathology of the School of Tropical Medicine, and the case reports of 175 patients with cholecystitis admitted to the Presbyterian Hospital during the past ten years. From these studies it can be seen that cholecystitis and cholelithiasis are of common occurrence in Puerto Rico. In *A Geography of Disease*, edited by McKinley,<sup>1</sup> gallbladder disease is listed as rare in Puerto Rico. Many reports from physicians in the tropics attest to the rarity of gallstones, and Larsen<sup>2</sup> cites reports from Haiti, the Philippine Islands, Africa, Trinidad, Panama, Cochin-China, Siam and Java, confirming this. In Java, out of 422,943 hospital patients, the diagnosis of gallstones could be confirmed in only 30 instances during a period of ten years.

Whipple<sup>3</sup> states that gallbladder disease is common in the Latin race. This is true of Puerto Ricans, in spite of the fact that Puerto Rico is subtropical in climate.

## AUTOPSY INCIDENCE OF CHOLELITHIASIS

Gallstones were found in 37 out of 950 necropsies under review, an incidence of 3.8 per cent. There were 655 males with 3.6 per cent, and 296 females with 4.3 per cent, incidence. Fifty-nine subjects, or 6.2 per cent of the 950 postmortem examinations done, showed evidences of cholecystitis. Of the 950 cases, 582 were white with 5.3 per cent having cholelithiasis, and 368 were black with a 1.6 per cent incidence of gallstones.

The 3.8 per cent incidence is low in comparison with that of other reports. This is due in part to the fact that 324 of the necropsies (approximately one-third) were done on subjects below the age of 20 years, with no stones appearing in this group. Of the remaining, 626 above 20 years (5.9 per cent) had stones. Of the females in this group, 7.9 per cent showed gallstones, while of the males, 5.1 were afflicted. Another factor to be considered is that the autopsy material was obtained largely

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from the poor class, in which cholelithiasis is less common than in the well fed group.

The last figure given (5.9 per cent) compares well with other reports on necropsy incidence of cholelithiasis, as we see in the following:

Author	No. of Necropsies	Race	Incidence	Place
Ludlow	4,800	W. & B. American	6.98	Ohio
Ludlow	275	Oriental	2.91	Korea
Alden	696	Negro, American	0.22	Grady Hosp.
Crump	1,000	White	32.5	Vienna
Moser	1,655	- - - -	6.4	- - -
Clark	1,088	Cent. American	2.2	Canal Zone
DeLangen	196	Negro	0.166	New Orleans
Mentzer	612	W. American	20.0	Mayo Clinic
Michell	19,974	White	7.8	Munich
Michell	1,600	W. & B. American	3.1	Chicago
Hesse	80,802	White	6.0	Germany
Martensson	6,575	White	19.6	Stockholm
Irwin-Ramos	950	White Spanish & Negro	3.8	Puerto Rico

The low incidence of cholelithiasis in negroes has been discussed by several writers. The 368 patients classified as colored in the group herein reported with an incidence of 1.6 per cent confirms this finding.

There were 107 of the 950 autopsied subjects who showed the presence of past evidence of schistosomiasis mansoni infestation, and of this group 8 had gallstones (7.4 per cent), an incidence considerably higher than the average of 3.8 per cent. Twenty subjects had, or had had, sprue, 3 of whom had stones (15 per cent). Twenty also had typhoid fever, with 10 per cent having stones. Reference is made later to the incidence of cholecystitis in sprue.

Taking into consideration the type of necropsy material available for this survey, the authors conclude that the incidence of cholelithiasis in Puerto Ricans is about the same as that of other reported series.

CHOLECYSTITIS IN 175 HOSPITAL ADMISSIONS

There were 175 patients with cholecystitis admitted to the Presbyterian Hospital during the past ten years—approximately 1 per cent of the total admissions.

Race incidence, based on *clinical* statistics are given by Ludlow<sup>4</sup> as follows:

Place	Cases	Total Admissions	Per cent
Lankenau Hospital, 1921-25	452	21,380	2.114
Mayo Clinic, 1925	763	66,959	1.139

<i>Place</i>	<i>Cases</i>	<i>Total Admissions</i>	<i>Per cent</i>
Lakeside Hospital, 1925	34	6,688	0.508
West Indies (Trinidad)	11	64,126	0.017
Mexico	27	10,317	0.262
Korea	11	27,283	0.04
Presbyterian Hospital, San Juan 1925-36	175	17,902	0.91

The etiological factors causing gallbladder disease are not as yet completely understood. That gallbladder disease is common in Puerto Ricans is to be expected when one considers the following facts: early marriage and high pregnancy incidence (5.07 average for this series of 144 females), a diet reasonably generous in fat, the frequency of gastrointestinal infections and typhoid fever, and the prevalence of intestinal parasites.

There were 31 males to 144 females in this group, a 1:4.6 ratio. There were 151 white, 7 mulatto, and 17 black patients in the series. Age incidence was as given below:

<i>Age</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
1-10	0	0	0
10-20	2	4	6
20-25	1	14	15
25-30	0	26	26
30-35	4	17	21
35-40	9	19	28
40-45	3	17	20
45-50	3	18	21
50-55	5	10	15
55-60	3	11	14
60-65	1	6	7
65-70	0	2	2

It is of interest to note that the age incidence peak in the female group is reached between 25 and 30 years. In the usual course of experience the age peak is generally between 40 and 50 years. Early marriage and early and frequent pregnancies probably account for this. The number of pregnancies for this series varied from 1 to 20, averaging, as stated above, 5.07. There was one instance of 20, two of 19 and 3 of 14. Fifteen women had had over 10 pregnancies.

Nutritional studies of foodstuffs used in the Puerto Rican dietary now being carried on by Axtmayer and Cook<sup>5</sup> show that the average *jibaro*, or peasant, diet contains 61 gms. of fat. The average food purchase of the middle class contains 76 gms. of fat in a diet producing

2,400 calories per day. This is slightly lower than the average American diet. Ludlow,<sup>4</sup> commenting on the low incidence of gallstones in Koreans, found an average of 20.3 gms. of fat in 79 diet lists of 2,600 calories. DeLangen<sup>6</sup> found the blood cholesterol in the Malays, who rarely have gallstones, to be one-half that of Europeans, due to their low fat diets. Martensson<sup>7</sup> says that the occurrence of gallstones is more frequent in Sweden in the rich and fertile districts, and is less frequent during times of famine.

In our series there were 90 charity and 84 private patients, but since 75 per cent of all admissions are charity, the conclusion is permissible that cholecystitis is more frequent in the well-to-do class.

Dwyer<sup>8</sup> states that the familiar saying is that gallbladder disease is characteristic of fat females over 40 years of age, but as knowledge of gallbladder disease increases, this statement loses considerably in weight. In 600 histories studied by him, 43 per cent weighed less than 140 pounds and 35 per cent were under 40 years of age. In our series, 12 patients were classed as hyposthenic, 42 as asthenic, 55 as sthenic and 55 as hypersthenic (10 not classified). Twenty patients weighed less than 100 lbs. From the above statistics the typical Puerto Rican gallbladder patient is often a female, dark, thin and thirty, rather than fair, fat and forty.

Typhoid fever is common in Puerto Rico. In this series a definite history was obtained of 79 patients, 34 per cent giving a positive history of typhoid (15 per cent of all patients). Mentzer<sup>9</sup> found in 633 autopsies on typhoid patients that 23.3 per cent had gallbladder disease. Blalock<sup>10</sup> found typhoid a precursor of gallbladder disease in 28 per cent of 888 cases. Ried and Montgomery collected 28 cases of acute cholecystitis complicating typhoid fever. Two patients of this series had acute cholecystitis complicating typhoid fever, and in both, pure cultures of typhoid bacilli were recovered from the gallbladder.

In only one patient was a casual relationship found between intestinal parasites and gallstones. This patient, a 16-year old male, passed adult ascaris worms through a cholecystotomy tube following operation for acute cholecystitis. Twenty-five patients had round-, hook-, or whip-worms.

#### SYMPTOMATOLOGY AND DIAGNOSIS

The history, physical examination and cholecystogram have come to be the irreducible minimum for diagnosis in gallbladder disease. The symptomatology is too well known to warrant comment. The commonest presenting symptoms in this series was pain, 150 giving it. Nausea or

vomiting was complained of by 120. Indigestion and flatulence were recorded by 78. Forty complained of colic and 33 had jaundice.

Cholecystography was done in 123 instances and in 90 per cent X-ray diagnosis by this method was confirmed by subsequent operation. Duodenal drainage was done 35 times. Pus or crystals were found 22 times, with stones found later at operation. The test was of no value 7 times and was wrong in 6 instances. We agree with Hitzrot<sup>11</sup> who says that to be of value, duodenal drainage must be done a number of times on each patient and by a member of the staff especially trained to give the test.

#### SURGICAL PATHOLOGY, BACTERIOLOGY AND MORTALITY

The pre-operative treatment of cholecystitis has become more or less standardized during the past decade. A high carbohydrate, low fat diet, with intravenous glucose in those patients who were vomiting, has been routinely used. The Graham test for liver function using phenol-tetraiodophthalein was done simultaneously with cholecystography, and in those patients with high dye retention in the blood, operation was deferred until liver function improved.

Operation was performed on 137 patients, 38 refusing surgical treatment. Eleven cholecystostomies and 126 cholecystectomies were done. Choledochostomy was done 21 times. Drainage was instituted in 106 of the 137 operations, through the incision 75 times and through stab wounds 31 times. Upper right rectus incision was used in all but 11 cases, the remainder being of the subcostal type.

In only 2 instances did pre-operative treatment fail to quiet down acute symptoms of pain, fever and vomiting. Of the 175 cases only 12 were classified as acute severe cholecystitis. Surgical pathologic studies made by the Department of Pathology of the School of Tropical Medicine classified the material as follows:

Acute cholecystitis	12
Sub-acute cholecystitis	14
Chronic cholecystitis	96
Cholesterosis of gallbladder	10
Empyema of gallbladder	5

The percentage of acute cholecystitis (8.8 per cent) of patients operated on agrees fairly well with Graham's<sup>12</sup> figures (7.6 per cent of 848 cases); Robert Lee Payne, discussing a paper of Abell,<sup>13</sup> stated that in a series of 355 cases, 62, or 18 per cent, were real acute cholecystitis, and that 29 of these were gangrenous. The low incidence of

fulminating types of acute cholecystitis in this series is probably due to the attenuated virulence of streptococci in Puerto Rico (Morales Otero).<sup>14</sup>

In only 18 instances were cultures made of the gallbladder bile at operation. *B. coli* was found 7 times; *B. mucosus capsulatus*, 3; typhoid bacilli, 2; *B. proteus* and pneumococcus, 1 each; no growth, 4 cultures. The number cultured is too small to be of significance.

Gallstones were encountered in 121 patients by roentgenogram or at operation. The majority of these were of the mixed type. In 5 instances, pure cholesterol stones were found with cholesterosis of the gallbladder.

Associated disease conditions were found as follows: diabetes mellitus, 7; peptic ulcer, 5; sprue syndrome, 6; malaria, 4; schistosomiasis mansoni, 2; typhoid fever, 2.

In 137 operations there were 8 deaths, a mortality of 5.88 per cent. It is interesting to note that 7 of these deaths occurred during 97 operations performed from 1925 to 1933, and that only one death occurred in 62 operations during the last three years, with more emphasis placed on pre- and post-operative glycogen reserve. The causes of death were as follows: post-operative shock, 2; myocardial failure, 1; post-operative hemorrhage, 2; ileus and uremia, 1; liver death, 1; diabetes uncontrolled, 1.

#### SUMMARY

1. Cholecystitis and cholelithiasis are common in Puerto Ricans as shown by clinical and postmortem statistics.
2. The incidence is low in the negro.
3. The incidence of cholelithiasis seems to be higher than average in schistosomiasis, sprue and typhoid fever.
4. Gallbladder disease appears at an early age in Puerto Rican women.
5. The Puerto Rican gallbladder patient is as often dark, thin and thirty as fair, fat and forty.
6. The fulminating types of severe cholecystitis are not as common in Puerto Rico as in the United States.

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