



EPIDEMIOLOGY AND PREVENTION OF GALLSTONE DISEASE

Edited by
**L. Capocaccia, G. Ricci, F. Angelico, M. Angelico
and A. F. Attili**

Proceedings of an International Workshop on the Epidemiology and Prevention
of Gallstone Disease, held in Rome, December 16/17, 1983

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MTP PRESS LIMITED

a member of the KLUWER ACADEMIC PUBLISHERS GROUP
LANCASTER / BOSTON / THE HAGUE / DORDRECHT



Acknowledgement

The Editors wish to express their deep gratitude to Professor Jeremiah Stamler and Professor R. Hermon Dowling for their enthusiastic cooperation and continuous scientific support in the organization of the Workshop.

The Workshop was financially supported by
Gipharmex S.p.A., Milan.

Published in the UK and Europe by
MTP Press Limited
Falcon House
Lancaster, England

British Library Cataloguing in Publication Data

Epidemiology and prevention of gallstone
disease.

1. Gallstones 2. Cholesterol

3. Epidemiology

I. Capocaccia, L.

616.3'65 RC850

ISBN 0-85200-850-3

Published in the USA by
MTP Press
A division of Kluwer Boston Inc
190 Old Derby Street
Hingham, MA 02043, USA

Library of Congress Cataloging in Publication Data

International Workshop on the Epidemiology and Prevention
of Gallstone Disease (1983:Rome, Italy)
Epidemiology and prevention of gallstone disease.

"Proceedings of an International Workshop on the
Epidemiology and Prevention of Gallstone Disease, held
in Rome, December 16-17, 1983."

Bibliography: p.

Includes index.

1. Calculi, Biliary—Congresses. 2. Calculi, Biliary
—Prevention—Congresses. 3. Epidemiology—Congresses.

I. Capocaccia, L. II. Title. [DNLM: 1. Cholelithiasis—
occurrence—congresses. 2. Cholelithiasis—prevention &
control—congresses. WI 755 1593e 1983]

RC850.157 1983

616.6 22

84-12600

ISBN 0-85200-850-3

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Typeset by Cotswold Typesetting Ltd, Gloucester
Printed by Cradely Print plc, Warley, West Midlands
Bound by John Sherratt and Sons Ltd, Manchester

**Epidemiology and
Prevention of
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Part I
EPIDEMIOLOGY OF GALLSTONE
DISEASE TODAY

Chairmen: W. P. CASTELLI and A. MENOTTI

1

Why talk about epidemiology of gallstone disease?

A. MENOTTI

The aims of epidemiological research conducted for scientific purposes are basically three: (1) the definition of the size of the problem (prevalence, incidence, mortality, fatality); (2) the search for 'causes', better called in epidemiology 'risk factors'; (3) the demonstration of the feasibility of primary prevention through preventive trials.

An epidemiological survey has a number of requirements among which are the identification of a specific question, the availability of a denominator representing a 'population', and the adoption of a strictly standardized methodology. The same type of approach and needs are to be considered when dealing with the epidemiology of gallstone disease, which has attracted so much interest during the last few years.

There are at least four good reasons for the rise in this spread of interest. First of all, many clinicians have opened their mind to epidemiology, and have recognized the need to look outside the walls of their clinical wards, outpatient clinics and laboratories, and to approach population studies with a view to answering precise questions, mainly concerning aetiology, natural history and prevention. Second, during the past 20 years comprehensive and standardized procedures have become available for the conducting of population field studies directed at the investigation of chronic non-communicable diseases. Although most of the work in this field has been developed for cardiovascular diseases it is relatively easy to transfer and adapt such procedures to the study of the other conditions. Then echography has appeared, showing its fundamental role in the diagnosis of gallstone disease. It is reported to provide a high sensitivity and specificity compared with traditional X-ray procedures, and some other fundamental prerequisites of tests being employed in epidemiology, i.e. safety, non-invasiveness and relatively simple performance.

Finally the possible interrelationship between gallstone disease and atherosclerosis is another source of interest. In fact some possible partially common metabolic channels, such as those involving lipid metabolism, are

apparently involved in both conditions, favouring the merging of interest of those dealing with liver diseases and those dealing with cardiovascular diseases.

From this point of view it is worth recalling one of the early reports when the two conditions were connected. At the beginning of this century De Langen, a Dutch physician working in Indonesia, found the Javanese to be characterized by much lower levels of blood cholesterol than was the rule in the Netherlands, and he associated that difference with a substantial difference in the frequency of disorders which he believed were related to cholesterol metabolism, i.e. atherosclerosis, gallstones and phlebothrombosis¹. Later he noted that Javanese stewards on Dutch passenger ships who ate Dutch food had similar blood cholesterol levels to Dutchmen, and he advocated a low-cholesterol diet (similar to the Javanese diet) for the prevention of atherosclerosis and gallstones.

The convergence of those elements mentioned above has stimulated several groups even in Italy, such as those in Bologna and Rome, to start important field operations for the epidemiological study of gallstone disease. A number of questions can be answered by such studies and some of them are listed below:

- (1) What is the true prevalence of gallstone disease?
- (2) What is the proportion of asymptomatic cases?
- (3) Is there a different prevalence between sexes?
- (4) Which individual characteristics are associated with the presence of the disease?
- (5) Which is the metabolic profile associated with the presence of the disease?
- (6) What is the incidence of the disease?
- (7) Does the incidence differ between sexes?
- (8) Which are the risk factors of the disease?
- (9) Are there different risk factors for symptomatic vs. asymptomatic cases?
- (10) Are risk factors different for the two sexes?
- (11) What is the metabolic profile preceding the occurrence of the disease?
- (12) Are there similarities or differences between the metabolic disorders preceding atherosclerosis and those preceding gallstone disease?
- (13) What is the natural history of asymptomatic cases?
- (14) Is there a procedure for preventing the disease?
- (15) Is such a procedure, if any, feasible on a large scale?
- (16) Is such a procedure compatible with the prevention of other chronic diseases involving lipid metabolism?

There are many theoretical bases indicating that the studies started in Italy and elsewhere can provide interesting results, as suggested by some of those already reported.

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2

Findings on gallstone disease in the ISTAT* investigation

G. GIUNCHI

A sample survey on the health conditions of the Italian population was planned by the Central Institute of Statistics. Screening operations were performed between 10 and 15 November 1980 through a questionnaire interview in 75 397 subjects (i.e. 0.134 % of the Italian population) belonging to all Italian regions. Details of the protocol have been published elsewhere¹.

As far as concerns cholelithiasis, each subject was asked whether he was aware of having gallstones.

Prevalence of subjects aware of having gallstones and prospective evaluation of the total number of cases is shown in Table 1. Overall prevalence of cholelithiasis in the Italian population is 1.93 %. Prevalence increases with age, reaching a peak in the 60–69-year age group. The female/male ratio is higher during the women's fertile period. Prospective evaluation of the data acquired from the investigation reveals that the total number of subjects aware of having gallstones in Italy should be 1 087 000, of which 314 000 are males and 773 000 females. It has been reported, however, that awareness of having gallstones is present in only one-third to one-half of all gallstone subjects. It can thus be roughly calculated that the total number of gallstone subjects in Italy should be between 2 and 3 million people.

The distribution of already discovered gallstone disease in different Italian regions is shown in Table 2. Prevalence of the disease varies from 1.16 % in Sicily to 2.98 % in Marche. These regional differences could be explained, at least in part, by differences in hygienic and sanitary conditions and in diagnostic procedures in different areas. It should be remembered that great differences exist also in ethnic and environmental situations.

Prevalence of gallstone disease, with respect to civil status, increases from the unmarried to the married or 'other civil status' (widowed, separated or divorced) (Table 3). Sex and age standardization, performed by the indirect method, tends to lead to a uniform prevalence of the disease between the

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EPIDEMIOLOGY OF GALLSTONE DISEASE

Table 1 Prevalence of gallstones in Italy according to age

Age (years)	Total		Females		Males		F/M Ratio
	n	Percentage	n	Percentage	n	Percentage	
13	4 000	0.04	1 000	0.02	3 000	0.05	0.4
14-29	27 000	0.21	16 000	0.25	11 000	0.17	1.47
30-39	118 000	1.55	94 000	2.44	24 000	0.64	3.8
40-49	222 000	2.92	158 000	4.05	64 000	1.73	2.34
50-59	298 000	4.00	202 000	5.30	96 000	2.64	2.0
60-70	251 000	4.45	172 000	5.72	79 000	2.99	1.91
71	167 000	4.02	130 000	5.29	37 000	2.18	2.42
Total	1 087 000	1.93	773 000	2.68	314 000	1.14	2.46

ISTAT INVESTIGATION OF GALLSTONE DISEASE

Table 2 Distribution of gallstone subjects in different Italian regions

<i>Region</i>	<i>Males</i>	<i>Females</i>	<i>Total</i>	<i>Prevalence (%)</i>
Piemonte/Valle Aosta	27 518	62 539	90 057	1.98
Lombardia	47 694	122 755	170 449	1.93
Trentino	3 068	13 077	16 145	1.87
Veneto	16 662	44 417	61 079	1.42
Friuli-Venezia Giulia	6 345	27 249	33 594	2.74
Liguria	15 697	25 590	41 287	2.28
Emilia-Romagna	25 840	72 640	98 480	2.51
Toscana	22 105	55 343	77 448	2.17
Umbria	5 072	12 623	17 695	2.21
Marche	13 679	28 200	41 879	2.98
Lazio	34 624	84 154	118 778	2.37
Abruzzi	10 273	18 297	28 570	2.32
Molise	1 994	3 637	5 631	1.69
Campania	22 575	57 561	80 136	1.47
Puglia	19 301	47 595	66 896	1.71
Basilicata	3 549	9 498	13 047	2.12
Calabria	7 838	31 501	39 339	1.90
Sicilia	23 665	34 318	57 983	1.16
Sardegna	6 583	22 254	28 837	1.81
Italy	314 082	773 248	1 087 330	1.93

Table 3 Cholelithiasis in Italy, prevalence according to civil status

	<i>Civil status</i>			<i>Total</i>
	<i>Unmarried</i>	<i>Married</i>	<i>Other civil status</i>	
Number of cases	72 000	819 000	193 000	1 084 000
Prevalence (%)	0.58	2.84	4.71	2.39
Age and sex standardized prevalence (%)	1.53	2.49	2.48	2.39

married subjects and those with 'other civil status', while the low prevalence in the unmarried group could be partly explained by a possible lower number of pregnancies in females belonging to this group.

Prevalence of gallstones with respect to educational status is reported in Table 4. Prevalence of gallstones is higher in subjects with low level of education (primary school) than in those who reached the secondary or high school level. Age and sex standardization do not greatly modify this trend, which could again be explained by a higher number of pregnancies in females with a low level of education.

In conclusion, although this study recorded only already diagnosed cases of gallstone disease, it shows that the total number of gallstone subjects in Italy should be 1 087 000. Taking into account also the undiscovered cases, prospective evaluation shows figures between 2 and 3 million Italians. A higher prevalence exists in females than in males, especially during the women's fertile period. The observed differences between the different Italian areas suggest that more objective epidemiological studies should be undertaken in different Italian regions.