

## HEART DISEASE FROM A CASE-FINDING TUBERCULOSIS SURVEY IN SINGAPORE, 1958

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Radiologic surveys for the detection of pulmonary tuberculosis in communities have incidentally uncovered the presence of various cardiovascular diseases. In July 1958, the first case-finding tuberculosis survey was undertaken in Singapore (Harvey et al., 1958). Persons showing abnormal cardiac shadows were examined to ascertain the prevalence of cardiovascular disease in this group. This paper records the results of this study.

### MATERIAL AND METHODS

The tuberculosis survey was conducted in four selected areas and was confined to persons over the age of 13 years. The total number of persons radiologically examined was 54,812 of whom 50,673 were residents of these areas and 4,139 non-residents. Two 70 mm. (Odelca-Watson) Units using spools of 40 frames and a phototimer were used. All persons whose X-ray films showed an abnormality of the cardiac shadow were requested to report for further examination. After clinical assessment, electrocardiography and further radiological studies were undertaken wherever necessary.

### RESULTS

Of the eligible population of 61,622 persons in the survey areas, 50,673 or 80% reported for radiological examination. Of this group 1,100 whose X-ray films showed cardiac abnormalities were advised to come up for further examination. Only 667 did so and the results of examination of this final group are given in Tables I-IV. 249 of these persons were found to be suffering from heart disease of whom only nine were previously known cases.

418 had no clinical evidence of heart disease. 25 women who were thought to have enlarged hearts radiologically were pregnant; they were followed up and found to have normal sized hearts after delivery. Other enlarged hearts were found in rather obese or broadly built persons. 51 had normal sized hearts with short systolic murmurs in the pulmonary or mitral areas. These were not regarded as evidence of organic disease. Many of the reported abnormal heart shadows were due to technical factors such as rotation of the patient, or high position of the diaphragm because of failure to take a

deep breath. A majority of clinically normal hearts were found in the age group below 30 years.

Hypertensive, rheumatic and congenital heart disease were the most frequent conditions seen (Table II). "Others" included six cases of situs inversus, two with thyrotoxic heart disease, one syphilitic aortic incompetence, one aortic aneurysm of syphilitic etiology, one myxoedema heart, one cor pulmonale and seven cases of enlarged heart with obesity but no evidence of diabetes mellitus or hypertension.

Of the 68 cases with rheumatic heart disease 54 had mitral valve disease (the majority being females), 9 had combined aortic and mitral valve lesions and 5 had isolated aortic valve lesions (Table III). There were 60 cases with congenital heart disease comprising 36 atrial septal defects, 22 ventricular septal defects and 2 patent ductus arteriosus (Table IV).

### DISCUSSION

The diagnosis of heart disease from X-ray films has long been recognised to be of limited value. Not all cases with abnormal heart shadows have cardiac disease and similarly cases with definite clinical cardiac disease may be missed because of a normal radiological shadow. It would not be possible, however, to find out the prevalence of heart disease in the latter group unless every person with a normal X-ray film is subjected to a full clinical examination — an expensive and time consuming affair. Although prevalence of heart disease in an area cannot be assessed on radiological examination, nevertheless it has some value as a method of case-finding especially in communities where surveys are carried out to discover pulmonary tuberculosis.

Mathisan et al. (1950) after two surveys for tuberculosis conducted in Vancouver, British Columbia, felt that this was an excellent method of case-finding in heart disease. From a total of 7,093 films only 22 cases of tuberculosis were discovered, but 158 films were selected as showing cardiac abnormalities in 90 of whom heart disease was clinically confirmed.

In this survey 249 cases of heart disease were brought to light out of the total of 50,812

Table I. Abnormal Films and Cases of Verified Heart Disease

	Number	Per cent
Survey population	50,673	100.00
Abnormal films	1,100	2.17
Cases examined	667	1.32
Cases verified heart disease	249	0.49
Cases previously unknown	240	0.47

Table II. Aetiologic Classification of Verified Heart Disease

	Male	Female	Total
Hypertensive heart disease	33	32	65
Rheumatic heart disease	26	43	69
Congenital heart disease	31	29	60
Arteriosclerotic heart disease	10	10	20
Enlarged hearts ? cause	10	6	16
Others	11	8	19
Total	121	128	249

Table III. Rheumatic Heart Disease

	Male	Female	Total
Mitral Valve Disease	15	39	54
Aortic Valve Disease	4	1	5
Combined Valve Disease	6	3	9
Total	25	43	68

Table IV. Congenital Heart Disease

	Male	Female	Total
Patent Ductus Arteriosus	0	2	2
Ventricular Septal Defect	12	10	22
Auricular Septal Defect	19	17	36
Total	31	29	60

who were radiologically examined of whom there was an overall total of 2,057 active cases of tuberculosis.

Selzer et al. (1951) mention that cardiac neurosis could be a troublesome by-product of a radiological survey. In the Singapore survey those who had abnormal cardiac shadows were informed of their freedom from pulmonary tuberculosis, but were requested to report for a medical examination. This caused some degree of anxiety among the persons concerned.

#### SUMMARY

A case-finding tuberculous survey was conducted in Singapore in 1958. Persons with radiologically abnormal cardiac shadows were

reviewed to ascertain the prevalence of cardiovascular disease.

Of an eligible population of 61,622, 50,673 were X-rayed. A total of 1,100 (2.17%) had abnormal heart shadows and of these 667 reported for clinical assessment. 249 had definite clinical evidence of heart disease. These were chiefly due to hypertensive, rheumatic and congenital heart disease.

#### REFERENCES

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