

## EPIDEMIOLOGY OF TUBERCULOSIS IN PORTO RICO

### II. PATHOLOGICAL FINDINGS IN 124 ROUTINE AUTOPSIES AND 1,000 MISCELLANEOUS SURGICAL SPECIMENS<sup>1</sup>

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In studying the epidemiology of any disease in which there are produced anatomical changes, more or less characteristic and permanent, the autopsy is a most valuable aid. This is strikingly true in chronic infections such as tuberculosis, leprosy, schistosomiasis, and trichiniasis, where even a healed lesion may persist for years with unmistakable evidence of its etiology.

In a newly investigated territory the autopsy may not only supply important data as to the incidence of tuberculosis, but it will also aid in determining the character of the process, thus throwing light on the degree of resistance of the people to the infection.

In Porto Rico it has been recognized for some years that tuberculosis was one of the most serious of the island's public health problems, but a thorough survey of conditions has not yet been made. The series of studies of which this is the second, represents an effort to determine the extent and the characteristics of the infection as it occurs here.

The observations in this study are based upon the findings in 124 autopsies and 1,000 surgical specimens received in the Pathological Laboratory of the School of Tropical Medicine.

In interpreting these findings, some standard of comparison was sought in the way of a similar number of cases from a representative medical center in continental United States. A series of autopsies done in New Haven, Conn., was chosen for this purpose, first, because the records happened to be available, and second as regards interest in tuberculosis, method of study, etc.

We are indebted to Dr. M. C. Wintermitz, Dean and Professor of Pathology in the Yale School of Medicine for permission to use the autopsy records of his department.<sup>2</sup>

<sup>1</sup> One of a series of studies made under the direction of Dr. Haven Emerson in a course on "Public Health Problems" given at the School of Tropical Medicine in March, 1928.

<sup>2</sup> An interesting pathological study of tuberculosis in the New Haven Hospital material will be found in an article by Dr. I. Wason, "Tuberculosis lesions in six hundred autopsies", Trans. Eighteenth Annual Meeting, Nat. Tbc. Assn., Washington, 1922.

Data from the two series in respect to age, sex, character of lesions, etc., have been arranged in tabular form. (See Tables I, II, III and IV.)

TABLE I

COMPARATIVE STUDY OF TUBERCULOUS LESIONS FOUND AT  
AUTOPSY IN PORTO RICO AND NEW HAVEN

Type of Lesion	Cases in Porto Rico series	Cases in New Haven series
Chronic pulmonary tuberculosis.....	10	2
Miliary tuberculosis.....	1	2
Tuberculous pneumonia.....	1	.....
Healed tuberculous foci in lung.....	9	7
Tuberculous foci in lymph nodes.....	14	7
Other definite tuberculous lesions, including peritonitis and meningitis.....	.....	3
Probable tuberculous lesions including scars in apices and apical pleural adhesions.....	27	40
Cases with no definite or probable tuberculous lesions.....	62	63
Total number of autopsies.....	124	124

TABLE II

## SEX OF AUTOPSIED CASES

Sex	Tuberculous Cases		Non-Tuberculous Cases	
	Porto Rico	New Haven	Porto Rico	New Haven
Male.....	51	41	55	52
Female.....	11	20	25	39
Total.....	62	61	80	91

TABLE III

## SEX AND AGE OF TUBERCULOUS CASES

Age	Porto Rico Series		New Haven Series	
	Males	Females	Males	Females
1-19.....	3	2	2	6
20-39.....	21	7	10	5
40-59.....	18	1	13	6
60.....	8	1	16	3
Age unknown.....	1	.....	.....	.....
Total.....	51	11	41	20

TABLE IV  
INCIDENCE OF TUBERCULOSIS AT VARIOUS AGES

Age	Tuberculous Cases		Non-Tuberculous Cases		Total Autopsies	
	Porto Rico	New Haven	Porto Rico	New Haven	Porto Rico	New Haven
1-19 .....	5	8	31	52	36	60
20-39 .....	28	15	26	10	54	25
40-59 .....	19	19	18	18	37	37
60-79 .....	9	18	2	10	11	28
80 .....		1	2	1	2	2
Unknown ....	1		1		2	
Total ....	62	61	80	91	142	152

NOTE: There were 25 stillbirths and young infants in the series of New Haven autopsies as compared with eight in the Porto Rico series.

In the Porto Rico series there were ten autopsies which were incomplete, with insufficient records respecting the thorax, and eight autopsies on stillbirths or infants under three months of age. These eighteen cases were omitted in making up Table I. To secure a similar number of cases for the New Haven series 152 consecutive autopsies done in 1921-22 were reviewed, of which three were incomplete and twenty-five were stillbirths of infants under three months. The autopsies in the New Haven series were done in the New Haven Hospital, a general hospital affiliated with Yale Medical School, the pathological department of the latter being responsible for the hospital autopsy service. (It should be mentioned that the New Haven Hospital does not admit open cases of tuberculosis.)

The Porto Rico autopsies were performed in small general hospitals of San Juan and other towns of the Island, the majority, however, in the Presbyterian Hospital and in the San Juan Municipal Hospital. There were no autopsies in special hospitals or sanatoriums for tuberculosis. The cases from the Presbyterian Hospital were done between May 13, 1926 and May 14, 1928. In this two-year period there were 2,474 hospital admissions and 89 deaths. Of the 89 deaths, 51, or 56 per cent, came to autopsy. Although it is the policy of the hospital to admit no tuberculous patients, twenty of the autopsies in this series, showed definite, though limited tuberculosis lesions. In only one, however, a case of sprue complicated by a tuberculous pneumonia, was the infection sufficiently extensive to be considered a contributory cause of death.

In the 124 cases autopsied there were 62 in which a *probable*

tuberculous lesion was found. In thirty-seven cases hookworms were encountered, and in ten there was evidence of malaria. These figures are given because the three maladies—tuberculosis, uncinariasis, and malaria,—are often referred to as Porto Rico's most serious health problems. However, it is not possible to draw any conclusions as to the relative frequency of the three infections since healed tuberculosis leaves its mark, whereas a cured hookworm infection leaves no trace, and it is a recognized fact that malarial pigment, often the only anatomic evidence of paludism, may disappear entirely from the organs.

In Table I we note a fair degree of similarity in the findings in the two series. Of the 124 cases in the New Haven series 63 showed no definite or probable tuberculous lesions while in the Porto Rico series sixty-two showed no such lesions. Probable lesions (apical scars and adhesions) were recorded in forty-one of the New Haven cases and in only twenty-seven of the Porto Rico series, there being thirty-five such cases, as compared with twenty-one in the New Haven group. (Doubtful lesions, such as general pleural adhesions, non-apical scarring of the lung, etc., present, of course, in both series, have not been considered, as having no special significance in this study.)

The division of the cases as to sex and age groups has been found instructive in tuberculosis surveys, and while our numbers are too small for such studies the data are submitted for what they may be worth.

Table II shows that in the Porto Rico series there were ninety men and thirty-four women; that is, about three to one, while among the tuberculosis cases alone in this series there were almost five men to one woman. In the entire New Haven series the ratio of men to women was approximately three to two and there were practically two men to every woman in which lesions could be demonstrated. Thus in each series the men suffered more from tuberculosis than the women but in Porto Rico the difference was greater. In studying the age groups, Table III shows that in the Porto Rico series the males of the age groups twenty to thirty-nine and forty to fifty-nine were much more often affected. In the New Haven series the distribution showed no such sex variation in any of the age groups except in those over sixty.

The only other findings in Tables II, III and IV worthy of note is that, excluding stillbirths, the number of autopsies in the age groups above twenty was about the same in the two series, though there were more old people; that is, persons over sixty years, in the

New Haven series. This difference undoubtedly corresponds to a difference in the general population of the two areas.

TABLE V  
TISSUE INVOLVED IN TUBERCULOUS LESIONS FOUND IN 1,000  
SURGICAL SPECIMENS

Tissue or Location	No. Of cases
Lymph glands .....	23
Chest wall .....	4
Testicle .....	3
Epididymis .....	2
Tonsil .....	1
Meso-appendix .....	1
Anal region .....	1
Skin .....	1
Tendon .....	1
Muscle .....	1
Fallopian tube and ovary .....	1
Total .....	39

TABLE VI  
ANALYSIS OF THE SIXTY SPECIMENS OF LYMPH GLANDS RECEIVED  
AMONG 1,000 SURGICAL SPECIMENS

Location	Tuberculous	Non-Tuberculous
Cervical .....	13	2
Inguinal .....	4	16
Mesentery .....	1	2
Axillary .....	2	
Retro-peritoneal .....	1	
Retro-caecal .....		1
Epitrochlear .....	1	
Generalized .....	1	
Miscellaneous (1) .....		16
Total .....	23	37

<sup>1</sup> The miscellaneous nodes include 3 specimens of Hodgkins disease, 2 of filariasis, 1 granuloma inguinale, and 11 of metastatic tumors. Glands received along with primary malignant tumors have not been included.

In looking over Tables V and VI which relate to the diagnosis of tissue from surgical specimens, we find that of the 1,000 specimens, thirty-nine showed tuberculous lesions, with lymph gland tuberculous responsible for almost two-thirds of these cases. This fact is of course of little value in estimating the incidence of the disease, since lymph glands invite surgical intervention, while most other tuberculous lesions do not. In Table VI it is seen that lymph nodes alone were received in sixty of the thousand specimens, in addition to a number of cases in which glands were received along with resected tumors. Of the sixty specimens twenty-three were tuberculous. A

majority of the cervical glands received were tuberculous while most of the inguinal nodes were not.

#### SUMMARY

1. Autopsy findings in a series of 124 cases in Porto Rico and in an equal number for, New Haven, Conn., show no striking differences in the character of the tuberculous lesions encountered. There is a greater number of active and advanced tuberculous lesions in the Porto Rico series, and a somewhat larger percentage of probable tuberculosis in the New Haven Series.<sup>1</sup>

2. The lesions in Porto Rico were more common in men than in women after the age of twenty and were comparatively rare in either sex under the age of twenty, but the number of cases reviewed is too small for any generalization on these points.

3. Glandular tuberculosis appears to be common in Porto Rico, with the cervical nodes easily occupying first place.

4. Though the series of cases is small, we believe the numbers are sufficient to show that the character of the tuberculosis present in Porto Rico is much the same as in continental United States, indicating therefore, a large measure of tuberculization of the people. This was to have been expected in view of the long history of close relations between the Island and Europe and the North American mainland.

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<sup>1</sup>The proportionately larger staff in pathology at New Haven, giving more time for study of individual cases, and the better and more uniform facilities for performing the autopsies, we believe may account for the higher percentage there of "probable" tuberculosis. It is a well recognized fact that the percentage of old tuberculous foci found may vary directly with the time and care given to looking for them.