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THE VALUE OF HISTOLOGICAL AND BACTERIOLOGICAL EXAMINATION IN TUBERCULOSIS OF BONES AND JOINTS

By

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INTRODUCTION

The frequency of the tuberculosis of bones and joints shows constant decrease. This is true generally, but varies greatly from country to country.

In Korea tuberculous spondylitis still often occurs (*Paus* 1960), and in Brazil the situation pertaining to this sector is as it was in the USA at the turn of the century (*Campos* 1954).

Moreover, publications from the USA and Scandinavia (*Alvik* 1949, *Felländer* 1954, *Hald* 1954, *Smith* 1955) show that tuberculous diseases of bones and joints still exist, although the conditions are under control.

The diagnosis of these illnesses are based on the patient's history, the clinical findings and the X-ray examination. However, to make the diagnosis with safety, one must show the presence of tbc. bacilles by cultivation or inoculation, or by a histological examination, which alone shows tuberculosis.

Ghormly (1926) stated that the microscopic tissue-examination was the most satisfactory. *Swift* (1936) found that the preoperative diagnosis of tbc. lesions of bones and joints was correct in about 75 per cent of the cases. Frozen section diagnosis corresponded to ordinary histological examination more than 80 per cent of the time, and to guinea-pig inoculation 84 per cent of the time. Among 100 patients who probably had tbc. spondylitis *Felländer* found tbc. in 92 cases. Histological examination was carried out on 86 patients with positive findings in 81 cases, in the case of the other 5 tbc. bacilles were found with guinea-pig inoculation. In all 84.5 per cent of the inoculations were found to be positive and 77 per cent of the cultivations. In our day

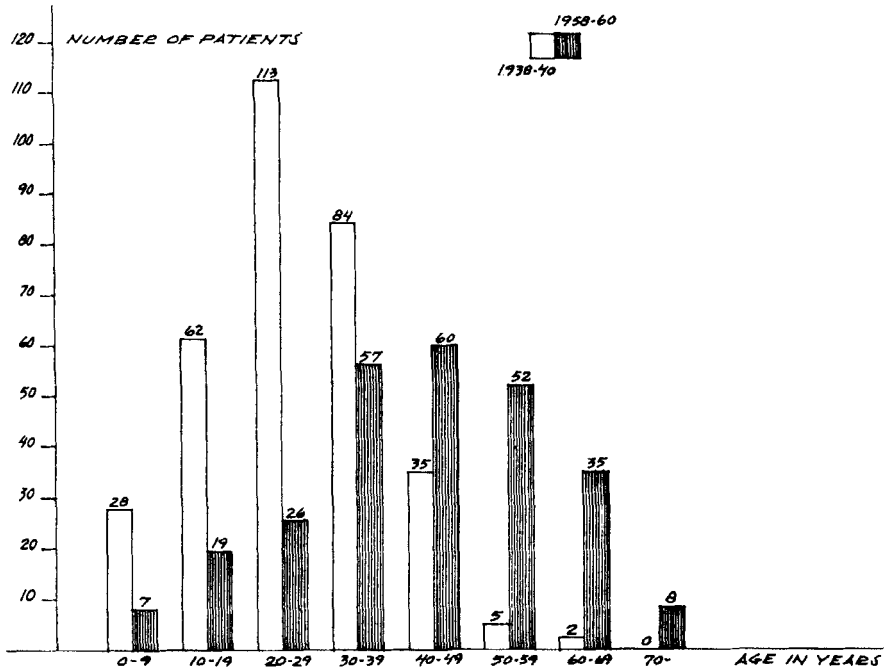


Fig. 1.

Distribution of age.

with several effective antituberculous drugs in use, the diagnosis must be completely correct, in order that one may be able to evaluate the results of the treatment. From this follows the importance of producing material for bacteriological and histological examination. The resistance some cherished earlier now seems to have terminated (*Holmdahl* 1960).

MATERIAL

To evaluate the accuracy of the histological and bacteriological examination of tbc. bone and joint diseases before and after the introduction of the treatment with tuberculostatics, we have gone through the patient-material of Martina Hansens Hospital for 2 periods of 3 years each, 1938-40 and 1958-60. The material comprises respectively 327 and 264 patients.

The table and figure reflect the decrease of tbc. lesions of bones and joints. For both periods there was found a preponderance among men, a condition which was known previously. The distribution of age in-

icates a tendency that is typical for all tuberculous illnesses. The average age for the 1st period is 26.5 years and for the 2nd period 43 years. Roughly speaking it would appear as if we had treated in both periods patients who were born about 1910-15.

SEX AND AGE

TABLE 1
Sex Distribution.

	Women	Men	Total
1938-40	153	174	327
1958-60	114	150	264

HISTOLOGY AND BACTERIOLOGY

TABLE 2

Localization of Lesion with the Diagnosis Confirmed by Histological or Bacteriological Examination. In Brackets, Number Examined with Negative or without Samples.

	1938-40	1958-60
Spine	41 (99)	55 (39)
Sacro-iliac	16 (10)	6 (1)
Trochanter, symphysis, ischium	10 (2)	21 (2)
Hip	33 (31)	48 (18)
Knee	12 (1)	25 (2)
Leg, ankle, foot	18 (13)	13 (2)
Upper extremity	22 (11)	23 (2)
Chest wall	8 (0)	6 (1)
Total	160 (167)	197 (67)

Table 2 shows to what extent we have verified the diagnosis bacteriologically and/or histologically. Seen as a whole the diagnosis was confirmed in the 1st period in 48.9 per cent of the cases, and in the 2nd period in 74.6 per cent. The survey of the localization of the tbc. lesions states principally from where the material for bacteriological and histological examination was taken. In cases with several localizations the samples were taken from the most dominant lesion. Every patient is registered only once. Spondylitis is the most usual manifestation

In the years 1938-40 the bacteriological examinations were performed by Prof. Anton Brandt, Norges Veterinærhøgskole, in the years 1958-60 by Statens Institutt for Folkehelsen. Almost all of the histological examinations were made by Prof. dr. med. Leiv Kreyberg, Rikshospitalets laboratorium for patologi (Pathological Laboratory).

with about 40 per cent of all cases in both periods. The relative frequency of the coxitis seems to be increasing; the other manifestations have occurred about the same extent as before.

TABLE 3

Comparison of the Results of Bacteriological and Histological Examination. Bact. Positive Means Positive Findings of tbc. Bacilles on Bacteriological Examination, etc.

	1938-40	1958-60
Bact. positive and hist. positive	62	108
Bact. pos., hist. negative	5	8
Bact. pos.	70	21
Hist. pos.	19	15
Hist. pos., bact. neg.	4	45

The results of closer analysis of how the positive diagnoses were made are shown in Table 3. It appears in addition that in the 1st period the tbc. bacillus was cultivated 137 times, *i.e.* in 85.6 per cent of the positive diagnoses. Histological diagnosis was made 85 times, *i.e.* in 53.1 per cent of the cases. In the 2nd period tbc. was cultivated from 137 patients, *i.e.* in 70 per cent of the positive diagnoses, and positive histological examinations were made among 168 patients, *i.e.* in 85.2 per cent of the cases.

TABLE 4

Comparison of the Results of Positive Bacteriological and Histological Examinations, at the Different Localizations of the Disease.

	1938-40			1958-60		
	Bact.+	Bact.+ Hist.+	Hist.+	Bact.+	Bact.+ Hist.+	Hist.+
Spine	36	3	2	6	35	14
Sacro-iliac	5	10	1	0	5	1
Trochanter etc.	2	5	3	3	10	8
Hip	13	14	6	6	22	20
Knee	4	6	2	8	10	7
Ankle etc.	5	7	6	1	9	3
Upper extremity	7	13	2	6	12	5
Chest wall	3	4	1	1	3	2
Total	75	62	23	31	106	60

In Table 4 there is set up a survey of how the bacteriological/histological diagnosis is represented for the different groups of the localization of the disease. In all it seems that the histological examinations yield more than they did previously, and of particular significance is the

fact that the histological diagnosis of the tbc. spondylitis now seems to be so solidly established. Most of the coxitis and metastases to the pelvis can be histologically confirmed, while for upper extremities and knees we ought to have results both of bacteriological and histological examinations before the diagnosis can be made or eventually excluded.

The evolution shows that with increasing frequency we were able to produce samples for bacteriological/histological examinations, because now with tuberculostatics at hand we can operate so much more safely than before. There are only 3 negative samples in the material of the 1st period, but in the 2nd period there are in all 24 negative samples, all for histological examinations. For the 1st period there are 163 samples from 327 patients, i.e. 49.9 per cent and for the 2nd period 221 samples from 264 patients, or 83.7 per cent.

In the last period we found that patients with positive findings of tbc. bacilles had received treatment with PAS-INH in about 6.3 weeks, while patients with positive histological examinations had received treatment in about 7.6 weeks, before the sample was taken for examination. The duration of the same premedication for the 24 patients with negative samples according to histological examination shows an average of about 15.6 weeks.

CONCLUSIONS

1. The average age of patients with tuberculous diseases of bones and joints has increased by about 16.5 years in the course of the 20-year period 1938-1958.

2. The diagnosis is confirmed with histological and/or bacteriological examinations for about one half of the cases in the 1st 3-year period, and about three fourths in the 2nd.

3. For the 1st period most of the positive findings were based on bacteriological examination, for the 2nd on histological examination.

4. The number of samples for bacteriological and histological examination are both relatively and distinctly greater in the 2nd period, the histological examination showing the most marked increase. This is probably due to greater operating frequency under protection of tuberculostatics.

5. Bacteriological and histological examinations are both still absolutely necessary for the diagnosis of tuberculous diseases of bones and joints.

SUMMARY

1938-40 327 patients with tuberculous diseases of bones and joints were treated in Martina Hansens Hospital, Sandvika, 1958-60 264 patients. The average age increased by 16.5 years in the course of the 20-year period. The diagnosis was confirmed for 48.9 per cent of the cases in the 1st period, 85.6 on bacteriological and 53.1 per cent on histological examination, for 74.6 per cent of the cases in the 2nd period, 70.0 per cent on bacteriological and 85.2 per cent on histological examination.

RESUME

Entre 1938 et 1940, 327 patients souffrant de maladies tuberculeuses des os et des articulations ont été en traitement à l'Hôpital Martina Hansen de Sandvika et entre 1958 et 1960, 264 patients. L'âge moyen s'est accru de 16,5 ans durant cette période de 20 ans. Le diagnostic a été confirmé dans 48,9 pour cent des cas pendant la première période, 85,6 pour cent sur la base d'un examen bactériologique et 53,1 pour cent sur celle d'un examen histologique et dans 75,6 pour cent des cas pendant la deuxième période, 70,0 sur la base d'un examen bactériologique et 85,2 pour cent sur celle d'un examen histologique.

ZUSAMMENFASSUNG

1938-40 wurden 327 Patienten mit Knochen- und Gelenkstuberkulose am Martina Hansen Krankenhaus, Sandvika, behandelt und 1958-60 waren es 264 Patienten. Das Durchschnittsalter nahm im Verlaufe des 20-jährigen Zeitraumes um 16,5 Jahre zu. Die Diagnose wurde in 48,9 Prozent der Fälle während der ersten Periode bestätigt, 85,6 Prozent davon mittels bakteriologischer und 53,1 Prozent mittels histologischer Untersuchungen, in 74,6 Prozent der Fälle während der zweiten Periode, davon 70,0 Prozent mittels bakteriologischer und 85,2 Prozent mittels histologischer Untersuchungen.

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