FROM THE DEPARTMENT FOR ORTHOPEDICS AND SURGICAL TUBERCULOSIS AT ST. GÖRANS SJUKHUS, STOCKHOLM. HEAD: ASSOC. PROF. SVANTE ORELL, M.D.

COMBINED SURGICAL AND CHEMO-THERAPY OF ABSCESSES IN BONE AND JOINT TUBERCULOSIS, EARLY RESULTS

By

PER ÖSTMAN

With regard to the combinations of chemotherapy of tuberculosis Eric Forsgren has said: "the combined chemo-treatment of tuberculosis bears a resemblance to expressionistic art. On a substantial background of PAS[1] one deposits a little streptomycin here, a little Conteben, penicillin, aureomycin or chloromycetin there. The amount of the dosage and the duration of the treatment varies from artist to artist". He believes that it is difficult to judge the results and that the specific indications are difficult to interpret. He also believes that the statement one meets with, in the daily press, indicating that the spread and mortality of tuberculosis has diminished *as a result of the new methods of treatment,* is not an adequate representation of the facts.

Incidentally, the mortality as well as the morbidity of tuberculosis has decreased very considerably during recent years in Sweden (Löfgren, the Medical Tuberculosis Department of St. Görans Sjukhus). As far as the Orthopedic Department is concerned, this tendency is similarly noticeable, as is shown in table 1.

The reasons for this favourable development will not be touched upon here. The majority agree that there are many reasons, and that chemotherapy may be one of them.

Referring to streptomycin, the World's Health Organization has warned against an overestimation of the effectiveness of the medicament and, in a circular dated Feb. 1950, pointed out that its use is not unattended by risk, that the indicative factors are not elucidated,

[1] PAS = Para Amino Salicylate.

especially in regard to lung tuberculosis, and that it would seem to be the object of attention which is out of proportion to its value.

Bosworth also says that the situation is vague and can only be juged on the basis of very large and carefully studied groups of cases, and that one generation is scarcely long enough to serve as a period of observation.

Pictures, illustrative of today's situation, are also very incomplete. The group of patients who have been treated at the Orthopedic clinic of St. Görans Hospital, in accordance with the principles of Orell,

TABLE 1

No. of dead in relation to no. of newly admitted patients.

Year	40	41	42	43	44	45	46	47	48	49
admitted	150	212	196	177	188	230	237	209	183	208
deaths	9	7	10	6	6	9	9	8	3	3
%	6,0	3,3	5,1	3,4	3,2	3,9	3,8	3,8	1,7	1,4

that is to say, with PAS as basic medicament and operation upon the tuberculous focus accompanied by simultaneous local and general application of streptomycin and penicillin, comprises 56 patients and 58 operations. Of these 2 had two localizations, rib-spine and pelvis-trochanter. 51 had abscesses or fistulae, while 7 were joint cases with neither abscess nor fistula. Hirsch has followed 14 spondylitis and Lindahl 10 trochanteritis cases which have been described elsewhere. The present writer will give an account of the other cases, with abscesses and fistulae, which have been surgically treated in the period from March 1949 to April 1950.

As already mentioned, it obviously takes years before the final results of chemotherapy can be judged. In estimating the early results, lung specialists have been guided by the changes in the temperature, sedimentation rate and blood picture which occur during the first 4 weeks of treatment. Stavenow considers that the best results in this respect have been achieved by PAS-streptomycin in combination. The conditions are somewhat different in bone and joint tuberculosis, which is a rather late, chronic and, as a rule, relatively benign manifestation of tuberculosis. The patients are generally afebrile. The white blood cells are seldom affected. The erythrocyte sedimentation rate is often, but by no means always, increased. It also increases, as

TABLE 2

Cases with fistula or abscess.

Procedures: evacuation of abscess, focus, fistula + fistular excision (in certain cases) + eventual interventions (in certain cases) + primary suture.

Localization	total = 27		primarily healed = 21		secondarily healed = 4		not healed = 2	
	fistula 16	abscess 11	fistula 12	abscess 9	fistula 3	abscess 1	fistula 1	abscess 1
Rib-sternum (rib resection)	6	1	5	1	1			
Shoulder								
+ joint resection	2		2					
abscess evac. only	1		1					
Elbow	1		1					
Wrist	2		1		1			
Sacro-iliac								
+ bone implant		3		3				
femoral abscess only		1		1				
Pelvis		2		1				1
Hip								
+ partial caps. excis.		1		1				
+ total caps. excis., no primary suture		1				1		
evacuation only	1						1	
Knee joint								
+ joint resection	1		1					
Ankle		1		1				
Foot skeleton								
+ bone implant	1				1			
as above	1	1	1	1				

a rule, in connection with surgical intervention, and one must consider that this operative effect lasts for several weeks.

Roentgenographic changes are also too slow to depict the early effect of the treatment. Thus, it is only the primary operative results that one can survey. Obviously, it is desirable to eradicate a focus, frequently one of fistulous type. If the operation wound heals and remains intact during the period of observation, this can be looked upon as a sign of successful intervention. It is these *early healing results* which will be discussed in the following report.

A number of objections can be raised against such an interpretation. There are no comparable cases where the operative treatment *with* and *without chemotherapy* is involved. No one dares to risk such an intervention nowadays without the protection chemotherapy is supposed to give. In the past, the indications for operation were different and, possibly, the tuberculosis was of another type. Orell has recalled that in the past it was considered a gross professional error to open a closed tuberculous abscess. Results seem to indicate that we are on the way to prove the contrary. It is possible that the earlier disheartening experiences in operating on abscesses may, nevertheless, serve for comparison in one way or another. It should be pointed out, however, that prior to the use of chemotherapy, the opening of an abscess was not always accompanied by frightful results. In our orthopedic department there was a case of sciatica which both clinically and roentgenographically manifested discrupture but where the surgeon, when operating upon the affected disc, discovered a spondylitic abscess. The pus was withdrawn, the wound primarily sutured, and the patient was treated afterwards with operative fusion in the usual way complication-free.

Table 2 is a summary of the cases to be considered in this report. The observation period varies between 2 and 14 months. For healed patients the average is 6 months and 10 days. All are treated according to Orell's scheme.

It can be stated in summary, that of 27 cases of surgically treated abscess or fistula, only 2 failed to heal. One of these was a focus in the os pubis which healed after reoperation; the other was a fistulous coxitis in an elderly man who had suffered many years. Owing to the poor general condition of the patient the operation was limited to the excavation of the fistulae. He was considerably better however, and no further, more radical intervention was thought advisable. Other experience has also been gained through particular cases. There was a case of tuberculous meningitis, a child aged 5, who had been given large doses of PAS and streptomycin at a pediatric clinic. She

had also received streptomycin and a fibrinolytic preparation intrathecally. While the patient was on this intensive chemotherapeutic regimen, a progressive calcaneal focus developed. This was surgically treated, according to Orell's scheme, with moreover, implantation of bone from another patient. A rapid healing with healing of the transplant followed. The child also appeared to be free from the meningitis. This case was previously reported by Dr. Lingen.

We have attacked the chronic fistulous processes, or abscesses, where there was an imminent risk of a fistula developing, i.e., the *orthopedic tuberculous bacillus-bearer*. From our observations of these early cases, we can hope that the majority will in the future continue to be free from fistulae. However, even the temporary removal of a fistula can, of course, be of value.

Earlier experience also showed that PAS-streptomycin-penicillin therapy alone, had, as a rule, no great effect on abscesses or fistulae, associated with bone and joint foci. *It is the combination with surgical intervention which is the essential.*

The operations have involved no disadvantages, worthy of note, for the patients. It would seem, as Orell has pointed out, that there are no risks of complication from the streptomycin when the periods of administration are as short as two weeks.

The costs are not excessive. The general and local streptomycin-penicillin umbrella in connection with an operation, cost, in June 1950, about 100 Sw. Kronor. This together with 120 Kr., for 90 days of PAS, makes the total cost of chemotherapy 220 Kr., less than the real costs of a week's stay in the public wards at a hospital in Stockholm. Furthermore the cost of the drugs is showing a tendency to diminish.

SUMMARY

During the recent years the tuberculosis mortality in Sweden has fallen considerably. The reasons for this are undoubtedly numerous, the use of specific chemotherapy may be one. A brief review is given of the possibilities in judging the results of para-aminosalicylate-streptomycin-penicillin-treatment combined with evacuation of the tuberculous foci (new method described by S. Orell). The author analyzes the first 27 cases of skeletal tuberculosis epecially in point of primary healing of the skin. (The spondylitis cases and trochanteritis cases are described in other places by Dr. Hirsch and Dr. Lindahl, and are not included in this material). 16 cases had abscesses, and 11 cases had draining sinuses. Only one in each group did not heal. Observation time averaged half a year. Chemotherapy alone had little effect. No

streptomycin complications were observed with these small doses. Drug costs are relatively small.

RESUME

Au cours des dernières années la mortalité de la tuberculose est considérablement tombée en Suède. Il faut sans doute attribuer ce fait à de nombreuses causes, mais la chimiothérapie spécifique peut en être une. Un aperçu sommaire est donné des possibilités d'appréciation des résultats du traitement à la paraaminosalicylate-streptomycine-pénicilline, combinée à l'évacuation des foyers tuberculeux (nouvelle méthode décrite par S. Orell). L'auteur analyse tout d'abord 27 cas de tuberculose osseuse ou articulaire (spondylites et trochantérites non comprises, celles-ci étant décrites ailleurs par Hirsch et Lindahl) en se plaçant notamment au point de vue de la guérison primaire de l'épiderme. Il y avait des abcès dans 16 cas et des fistules dans 11. Un seul cas dans chaque groupe n'a pas été guéri. Les observations portent sur une durée moyenne de six mois. La chimiothérapie appliquée seule n'a eu qu'un effet limité. En administrant les petites doses envisagées, on n'a constaté aucune complication subséquente à la streptomycine. Le coût des médicaments est relativement bas.

ZUSAMMENFASSUNG

Während der letzten Jahre ist die Tuberkulosesterblichkeit in Schweden bedeutend zurückgegangen. Die Gründe dafür sind zweifellos zahlreiche. Einer von ihnen ist möglicherweise die spezifische Chemotherapie. Eine kurze Übersicht der Möglichkeiten der Beurteilung der Paraaminosalizylat-Streptomycin-Penicillin Behandlung kombiniert mit Entleerung der tuberkulösen Herde (nach der von S. Orell beschriebenen Methode) wird gegeben. Der Verfasser analysiert die ersten 27 Fälle von Knochen- und Gelenkstuberkulose besonders vom Gesichtspunkte der primären Heilung der Haut. (Die Fälle von Spondylitis und Trochanteritis wurden an anderer Stelle von dr. Hirsch und dr. Lindahl beschrieben und sind nicht in diesem Materiale mit einbezogen). 16 Fälle hatten Abszesse und 11 Fälle hatten Fisteln. Nur ein einziger Fall in jeder dieser Gruppen heilte nicht primär. Die Beobachtungszeit betrug im Durchschnitt 6 Monate und 10 Tage. Chemotherapie allein hatte geringe Wirkung. Keinerlei Streptomycinkomplikationen wurden mit den kleinen Dosen, die gegeben wurden, beobachtet. Die Heilmittelkosten für Chemotherapie waren verhaltnismässig niedrig.

REFERENCES

Forsgren, E.: Huru verka kemoterapeutika och antibiotika vid behandlingen av tuberculos? (The influence of chemotherapy and antibiotics in the treatment of tuberculosis). Svenska Läkartidningen 1950: 47: 823 (nr. 14).

Hedlund, P., Holme, T., Lichtenstein, A., and *Lingen, Chr.:* Kombinerad streptomycin- och streptokinasbehandling vid tuberkulös meningit. (Treatment of tuberculous meningitis with streptomycin and streptokinase in combination). Nordisk Medicin 1950: 44: 1310 (nr. 33).

Löfgren, S.: Förändringar i knölrosens frekvens och åldersfördelning som tecken på snabbt sjunkande tuberkulosmorbiditet. (Changes in incidence and age distribution of erythema nodosum indicating a rapidly decreasing tuberculosis morbidity). Svenska Läkartidningen 1950: 47: 1295 (nr. 22).

Orell, S., and *Östman, P.:* Kemoterapi vid behandling av ortopedisk tuberkulos. (Chemotherapy in the treatment of orthopedic tuberculosis). Svenska Läkartidningen 1949:46:2810 (nr. 52). Review in International Abstract of Surg., Gyn., and Obst. July 1950.

Report from the Expert Committee on Tuberculosis, WHO, the fifth session of the Executive Board, Geneva, February 1950.

Stavenow, S.: Personal communication.