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## Contents

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<b>Editorial: Lymph Node Biopsy in Osteo-articular Tuberculosis</b> — <i>P.K.. Duraiswami</i>	... 1
<b>Role of lymph node biopsy in the diagnosis of osteo-articular tuberculosis involving the bone and joints of the upper extremity</b> — <i>G. K. Vishwakarma, B. N. Sinha and M. K. Goel</i>	... 3
<b>Role of lymph node biopsy in the diagnosis of tuberculosis involving the bone and joints of lower extremity</b> — <i>G. K. Vishwakarma, B. N. Sinha and M. K. Goel</i>	... 6
<b>Pseudotuberculous conditions of lungs</b> — <i>V. Sundaram</i>	... 9
<b>Pulmonary tuberculosis among previously B. C. G. Vaccinated persons</b> — <i>S. Brahmananda Rao</i>	... 14
<b>Tuberculosis of the breast</b> — <i>H. B. Dingley</i>	... 21
<b>Appearance of spontaneous pneumothorax during corticosteroid therapy</b> — <i>S. K. Khanna</i>	... 24
<b>Agranulocytosis due to Thiacetazone</b> — <i>J. L. Bhatia and Harbans Lal</i>	... 27
<b>Eastern Regional Committee Sixth Conference</b> — <i>S. P. Pamra</i>	... 29

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News & Notes    \*\*    Abstracts

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# The Indian Journal of Tuberculosis

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## LYMPH NODE BIOPSY IN OSTEO-ARTICULAR TUBERCULOSIS

Early treatment of all forms of tuberculosis is ideal especially in view of the efficacy of the modern anti-tuberculous drugs and osteo-articular tuberculosis is no exception. However, early diagnosis of this disease is by no means easy, as biopsy may have to be performed to establish the diagnosis in early cases of tuberculosis involving joints with its attendant risks. This method has given positive results in about 98 per cent provided the biopsy material is removed by a competent and experienced surgeon. There have been some mental reservations on this procedure in view of the risk of sepsis unless careful precautions are taken. The consensus of opinion is that this method may be adopted when a combination of all other examinations *viz.* clinical, radiological etc., fail to produce a definite diagnosis. Due to these reasons, the value of other examinations assumes great importance.

Regional lymph gland biopsy wherever possible, is the next best method of diagnosis of osteo-articular tuberculosis. Nevertheless, it cannot be maintained that by removing a single gland the pathologist gets all that he needs to establish the diagnosis. It is quite possible that the lymph gland removed may be the one which is not infected. The selection of the gland for removal has to be made with great care. It must be clearly understood that a negative report does not rule out the possibility of tuberculosis in the affected joint.

Whether regional lymph node biopsy is still indicated when X-ray and other findings strongly suggest tuberculosis is debatable. It is best left to the judgment of the individual surgeon who will, no doubt, decide after evaluating his clinical, radiological and other findings in each case.

P. R. Duraiswami  
Director General of Health Services



## HOLE OF LYMPH NODE BIOPSY IN THE DIAGNOSIS OF OSTEO-ARTICULAR TUBERCULOSIS INVOLVING THE BONE AND JOINTS OF THE UPPER EXTREMITY

G. K. VISHWAKARMA, B. N. SINHA AND M. K. GOEL  
(From K. G. Medical College, Lucknow)

The importance of all ancillary methods of narrowing down the differential diagnosis in arthritis of every kind and different affections of bones, needs no emphasis. The removal of regional lymph nodes as an aid to diagnosis in chronic arthritis of tubercular origin is a comparatively less tried procedure and the degree of accuracy is not well established. The biopsy of a regional lymph node as an aid to the diagnosis of osteo-articular tuberculosis in its drainage area was not described until 1933, when Vails published an account of inguinal lymph node biopsy as an aid to the diagnosis of knee and ankle tuberculosis. Seddon (1939) was the first to do it in Great Britain. Most of series of cases that have been previously published have been relatively small.

The object of this work is to determine the proportion of positive findings in a regional lymph node in tubercular affections of the bones and joints of the upper extremity and to establish the degree of its usefulness and accuracy and its role in the diagnosis of the disease.

### Methods & Material

Histological study of 48 lymph nodes in cases of tuberculosis involving the bones and joints of the upper extremity of the patients admitted at K.G. Medical College and G. M. A. Hospitals, Lucknow, in the year 1959-60, was carried out in the department of Orthopaedic Surgery.

The diagnosis of tuberculosis of the joints involved was confirmed by detailed clinical radiological examination of the joint involved and the lungs with the pathological examination of the material from the joint itself, the details of which will be discussed in separate papers.

The purpose of this paper is only to find out and stress the role and accuracy of lymph node biopsy in the diagnosis of osteo-articular tuberculosis, involving the bones and joints of the upper extremity.

All the glands were removed under local anaesthesia, except in children where general anaesthesia was employed. The lymph nodes were removed intact and trauma to it was avoided. Wound was closed as usual after instillation of Streptomycin powder. None of the cases got infected.

All the positive sections revealed well formed tubercles consisting of epitheloid cells, fibroblasts and Langhan's giant cells, with or without caseation.

### Result

In this series 48 lymph nodes were removed from forty eight cases. Forty four showed a positive result (98.6%). Only four gave a negative result.

Total cases analysed—48.

Lymph nodes removed—48.

Lymph nodes showing positive result—44.

Percentage of positive result—91.6%

*Result of Lymph Node Biopsy in Upper Extremity.*

Sr. No.	Site	Total No.	Lymph node removed.	No.	Result Positive	Result %
1.	Shoulder	7	Axillary	7	7	100%
2.	Elbow	17	a) Axillary	7	7	100%
	”		b) Epitrochlear	10		90%
3.	Wrist	13	a) Axillary	7	7	100%
	”		b) Epitrochlear	6	5	83.3%
4.	Ulna	3	Epitrochlear	3	3	100%
5.	Radius	3	—do—	3	2	66.6%
6.	Fingers	5	Epitrochlear	5	4	80%

\* At present Professor of Orthopaedic Surgery, Goa Medical College, Panjim, Goa.

### Observations

(a) Seven cases of tuberculosis of the shoulder were studied. Axillary lymph node was removed in all of them and a positive histological report was found in all.

Four of the cases were about fifty years of age and the rest below twenty years. In two cases huge abscesses were present in the lateral part of the scapula at the level of the inferior angle from which pus had been aspirated several times and found to be sterile after forty eight hours of incubation. In another multiple sinuses were present in the breast. X-ray showed destruction of the bone in each. E.S.R. was raised in all. Duration of illness was less than four months in three, less than eleven months in two and less than six months in other two cases.

(b) Seventeen cases of tuberculosis of the elbow joint were studied. An epitrochlear lymph node was removed in ten cases and positive result was in nine. An enlarged epitrochlear node was the node of choice. An axillary node was removed only when this node was absent. It was removed in seven cases and all gave positive result.

Duration of illness was less than three months in four ; sinuses were present in six ; and multiple healed sinuses were present in two; a positive result was found in all. X-ray showed only rarefaction of the bone in three cases and two gave positive result. Twelve cases where X-ray showed advanced lesion also gave positive result.

(c) Thirteen cases of tuberculosis of the wrist joint were studied. A positive histological result was found in twelve of them. An enlarged epitrochlear lymph node was removed in six and a positive result was found in five. An axillary lymph node was removed in seven and a positive result was found in all.

Duration of illness was more than one year in all cases ; sinuses were present in six cases ; X-ray showed destruction of the joint in all ; F.S.R. was raised in six ; all gave positive result.

(d) Three cases involving the ulna, three involving the radius and five involving the digits were studied. Epitrochlear lymph node was removed in all the cases. One case of tuberculous dactylitis and another of tuberculosis radius gave negative result.

### Discussions

In this study of lymph node biopsy the per-

centage of positive result was much higher. About 91.6% gave a positive result. Simon—Sevitt (1954) did lymph node biopsy of the epitrochlear lymph node in eight cases of tuberculosis of the hand and the wrist. In seven patients the histological diagnosis of tuberculosis was made. Arden, G.P. and Scott, J.C., (1947) performed lymph node biopsy for suspected bone and joint tuberculosis of the elbow in three cases out of which two were positive. The one negative also proved to be tubercular.

Although the biopsy was performed in a limited number of cases, yet it was interesting to note that all in all gave positive result in cases of the lesion in the shoulder. It is felt that if it had been possible to get more cases perhaps, this would have been a decisive factor in refuting or confirming the diagnosis.

In case of the lesion involving the other parts of the upper extremity it was felt that axillary lymph node was the node of choice in absence of the enlarged epitrochlear lymph node. In this series either a palpable epitrochlear or axillary lymph node was selected. It was felt that an enlarged node is likely to give more positive information at an early stage.

Further under a screen of streptomycin, a regional lymph node biopsy can be carried out without risk of breakdown and such procedure should be undertaken in doubtful cases. Nevertheless a negative biopsy does not necessarily exclude a tubercular lesion and even in the presence of negative pathological findings, anti-tubercular drugs should be used if one were convinced on clinical and radiological evidence that the lesion was tuberculous.

### Conclusion

1. Lymph node biopsy is a useful method of diagnosis of osteo-articular tuberculosis and gives gratifying results in the lesions of the upper extremity.

2. Negative results do not necessarily exclude the possibility of osteo-articular tuberculosis.

3. A positive biopsy result gives strong support to the diagnosis of tuberculosis.

4. Removal of an axillary lymph node in case of tuberculosis shoulder and a palpable axillary or epitrochlear in case of other parts involving the upper extremity, is advised.

5. The merit of this procedure is simplicity, reliability and safety.

**ACKNOWLEDGEMENT**

We are grateful to the department of Pathology for allowing us to carry out the histological work in the department and particularly to Dr. R.M.L. Mehrotra for taking keen interest in the histological slides.

Our thanks are due also to the Medical Superintendent, Gandhi Memorial and Associated Hospitals for allowing us to consult the Hospital records.

**BIBLIOGRAPHY**

- (1) Arden, G.P., and Scott, J.C., (1947): "Lymph Gland Biopsies for suspected Bone and Joint Tuberculosis". Analysis of 100 consecutive cases *Brit. Med. J.* 2, 87, 89, July 19, 1947.
- (2) Saigal, M.D., Wahi, P.N., and Singh, G.B., (1954) "Lymph node and synovial membrane Biopsies in diagnosis of Joint tuberculosis" *Indian Journal of Medical Sciences*, 8:536-540, August 1954.
- (3) Sinha, B.N., Goel, M.K., Vaishwakrma, O.K., (1961) "Lymph Gland Biopsy in the diagnosis of osteo-articular tuberculosis" A preliminary report, *J. Indian M.A.*, Vol. 36, No. 10, June 16 1961.
- (4) Vishwakrma, O.K., (1960) "Role of Lymph Node Biopsy in the diagnosis of osteo-articular tuberculosis". Thesis submitted to the university of Lucknow for M.S., in Orthopaedics, December 1960.

## ROLE OF LYMPH NODE BIOPSY IN THE DIAGNOSIS OF TUBERCULOSIS INVOLVING THE BONE AND JOINTS OF LOWER EXTREMITY

G. K. VLISHWAKARMA, B. N. SLNHA AND M. K. GOEL  
(From K. G. Medical College, Lucknow)

In our country the patients with osteo-articular tuberculosis usually come at a very late stage of the disease. However, there are some cases who come very early in the course of the disease where the patient complains of little more than slight limp and some joint pain and shows the minimum of the signs either clinically or radiologically, that the difficulty in diagnosis arises. These are the cases who require careful investigation, and correct diagnosis for proper institution of the drugs which it is known when used judiciously are capable of altering to a marked degree, the natural history of the conservatively treated lesions. Further it is recognized that employing chemotherapy as a method of diagnosis of skeletal tuberculosis, is not only un-helpful but may be harmful. It does not clarify the diagnosis but masks it and produces greater difficulties later on.

Hence a method of early diagnosis of the disease or of its confirmation is worth investigating. The object of this work is to establish the degree of usefulness and accuracy of lymph node biopsy and its role in the diagnosis of osteo-articular tuberculosis involving the bones and joints of the lower extremity.

### Methods & Material

Histological study of 82 regional lymph nodes in cases of tuberculosis involving the bones and joints of the lower extremity of the patients admitted at K. G. Medical College and G. M. A. Hospitals, Lucknow, in the year

1960, was carried out in the department of Orthopaedic Surgery.

The diagnosis of tuberculosis of the joints involved was confirmed by detailed clinical, radiological examination of the joint and the lungs along with the pathological examination of the material from the joint itself, the details of which will be discussed in separate papers.

The purpose of this paper is only to find out and stress the role and accuracy of lymph node biopsy in the diagnosis of osteo-articular tuberculosis, involving the bones and joints of the lower extremity.

External iliac and popliteal lymph nodes were removed under general anaesthesia whereas inguinal lymph nodes were removed under local anaesthesia except in children.

All the positive sections revealed well formed tubercles consisting of epithelioid cells, fibroblasts and Langhans' giant cells with or without caseation.

### Result

- Total No. of cases studied—82.
- Total No. of lymph nodes removed—98.
- Total No. of lymph nodes showing positive result 56.
- Percentage of positive result—57.1%.

Sr. No.	Site	Total No. of patients	Lymph Node removed	No.	Positive Result	Result %
1.	Hip	21	(a) External iliac (b) Deep inguinal	14 21	126	65.7% 28.6%
2.	Knee	23	Deep inguinal	23	17	73.4%
3.	Ankle	33	(a) Deep inguinal (b) Popliteal	24 9	11 5	45.8% 55.6%
4.	Ileum	5	(a) External iliac (b) Deep inguinal	5 2	5 0	100% 0%

**Observations**

(A) Five cases of tuberculosis of the ileum were studied. External iliac lymph node was removed in all the five cases. Deep inguinal lymph node was removed in two. External iliac lymph node was positive in all cases whereas both deep inguinal lymph nodes gave a negative result. In one of the cases, there was an abscess in the region of the anterior superior iliac spines on the same side. The external iliac gave a positive result whereas the deep inguinal lymph node gave negative result. X-ray showed rarefaction in three cases and doubtful picture in two cases.

(B) Twenty one cases of the tuberculosis were hips studied. External iliac lymph node was removed in fourteen cases and deep inguinal in all of them. Out of fourteen external iliac nodes removed twelve -gave positive results. Out of twenty one deep inguinal lymph nodes removed only six gave positive results. All the cases where a histologically positive lymph node biopsy of the deep inguinal lymph node was obtained, had either an abscess or multiple sinuses in the hip or gluteal region. This explains their involvement.

Duration of illness was less than three months in six cases. X-ray showed only slight rarefaction in five cases. ESR was raised in nine cases. In all these external iliac node biopsy gave positive result,

(C) Twenty five cases of the tuberculosis of the knee were studied. Deep inguinal lymph node was removed in all. A histologically positive result was found in seventeen cases. Sinuses were present in five cases. Positive result was found in four of them. Duration of illness was less than three months in four cases. X-ray showed only rarefaction in twelve cases. In all a positive result was obtained.

(D) Thirty three cases of tuberculosis ankle were studied. Twenty four deep inguinal lymph nodes were removed and eleven gave a positive result. Popliteal lymph node was removed in nine and five gave a positive result.

Duration of illness was less than three months in nine cases and a positive biopsy was found in four. Sinuses were present in twelve and a positive result was found in three of them. Six cases showed early signs of tuberculosis clinically, lymph node biopsy was positive in three. Marked radiological changes were present in twenty and a positive result was obtained in ten cases. In three cases associated tubercular lesions were present. A

negative biopsy result of deep inguinal lymph node was obtained in a patient in whom an epitrochlear node gave positive result for the tuberculosis of the wrist. In another case of tuberculosis spine with paraplegia, deep inguinal lymph node biopsy gave negative result.

**Discussion**

It was observed that external iliac lymph node biopsy was very suggestive in tuberculosis of the ileum even in presence of minimal radiographic and doubtful clinical findings. Nearly all (five out of five) gave positive results whereas the deep inguinal gave negative result. This was quite helpful in differentiating it from a chronic pyogenic lesion of the bone.

In the case of hip, external iliac lymph node seems to be the node of choice. Surprisingly very high percentage of positive result was obtained (65.7%). Inguinal lymph node gave persistently negative result except in those cases which were associated with sinuses or abscesses either in the hip or in the gluteal region.

In case of knee, deep inguinal lymph node biopsy was found positive, in sufficiently large percentage of cases (73.4). The figures given by different authors are very variable (Arden Scott 23 positive results out of 60; Seddon 15 positive results in 18 cases). Here the fallacies of the lymph node biopsy must be taken into consideration.

Lymph node biopsy was negative in a large number of cases of tuberculosis of ankle. (Out of 24 deep inguinal lymph nodes removed, only 11 gave positive results 45.8%), (Arden Scott 5 negative results in a series of 25). Popliteal lymph node biopsy gave little better results, 5 positive results out of 9 (55.6%).

It may appear that variable results may be more due to wrong lymph node selection and the fallacies associated with the lymph node biopsy than due to anything else. If all the precautions are taken, perhaps more accurate and better results could be obtained. It is felt that under a screen of streptomycin, a regional lymph node biopsy can be carried out with safety. Such procedure should be undertaken in doubtful cases. Nevertheless, a negative biopsy does not necessarily exclude a tubercular lesion. And even in the presence of negative pathological findings antitubercular drugs should be used if one were convinced on clinical and radiological evidence that the lesion was tuberculous.

### Conclusions

(1) Regional lymph node biopsy is a valuable accessory means in the diagnosis of tuberculous infection of the bones and joints.

(2) A positive gland biopsy gives strong support to the diagnosis.

(3) Negative findings, however, do not exclude the tubercular lesion.

(4) An early positive lymph node biopsy gives strong support to a diagnosis of tuberculous infection before any changes that can be seen by X-ray are present and that if the result is positive it is likely that in the presence of a suggestive clinical picture, these can be accepted as confirmatory evidence.

(5) External iliac lymph node in case of tuberculosis of the ileum and the hip; Deep inguinal for knee and deep inguinal or popliteal for ankle, are the nodes of choice.

(6) The merit of the method is its simplicity and safety.

### ACKNOWLEDGEMENT

We are grateful to the department of Pathology for allowing us to carry out the histological

work in the department and particularly to Professor R.M.L. Mehrotra for taking keen interest in the histological slides.

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### BIBLIOGRAPHY

1. Arden, G. P. and Scott, J. C., (1947) "Lymph Gland Biopsies for suspected Bone and Joint Tuberculosis" Analysis of 100 consecutive cases *Brit. Meet. J.* 2, 87-89, July 19, 1947.
2. Saigal, M.D., Wahi, P.N. and Singh, C. B (1954) "Lymph node and synovial membrane biopsies in the diagnosis of Joint Tuberculosis" *Indian Journal of Medical Sciences*, 8:536-540, August 1954.
3. Sinha B.N., Goel M.K. Vishwakarma G.K. (1961) "Lymph Gland Biopsy in the diagnosis of osteo-articular tuberculosis" A preliminary report, *J. Indian M.A.*, Vol. 36, No. 12, June 16, 1951.
4. Vails, J., (1933) "Labiopsia Ganglionnaire comme moyen de diagnostic bony les arthritides chroniques des membres Brusulles"—*Med.* 13:1151-1155, August 6, 1933.
5. Vishwakarma, G K., (1960) "Role of Lymph node biopsy in the diagnosis of osteo-articular tuberculosis". Thesis submitted to the University of Lucknow for M.S., in Orthopedics, December 1960.

## PSEUDOTUBERCULOUS CONDITIONS OF LUNGS

V. SUNDARAM

(From Hospital for diseases of Chest and T.B., Hyderabad)

Pseudotuberculous conditions of the lungs are those having clinico-radiological resemblance and no bacteriopathological evidence of tuberculosis. These are not caused by *Myc. Tuberculosis* or other A.F. bacilli.

Till 1932 when Loeffler described the association of pulmonary infiltrates with peripheral eosinophilia, the shadows in the lungs were generally regarded as of tuberculous origin. Many authors also have described this syndrome in various conditions ranging from allergic response to various stimuli through infections and infestations, including collagen disorders.

Frimodt Moller, C. and Barton, R.M. (1940) were the first modern contributors, who after 15 years in a TB Sanatorium reported 175 cases with miliary mottling of the lung fields with hypereosinophilia and called them Pseudotuberculosis.

Steel S.J. (1964) described pulmonary parenchymal involvement by Hodgkins' disease in 35 to 40% of necropsies of patients who had this disease. Pulmonary involvement and cavitation occurring in Hodgkins disease is usually due to the concomitant infection. Occasionally Hodgkins' disease may be confined to the lungs and resemble P.T.

Mital O. P.' (1965) described pneumonia caused by Friedlander's bacilli looking exactly like pulmonary tuberculosis and distributed to posterior segment of rt. Upper lobe and superior segment of right lower lobe of lung, which are the segments frequently affected with TB. Both the acute and chronic stages of this condition have exact resemblance to P.T. Infection with Friedlander's bacilli is acute at starting with chill, pain in the chest, irregular pyrexia and productive cough and mild haemoptysis. The right upper lobe with cavitation is often affected and the physical signs are that of P.T. Here the involvement of upper lobe dense opacity makes radiological differentiation very difficult. In general this condition is treated as P.T.

Bordia, N.L. (1967) stated that abacillary cases with X-ray shadows consistent with diagnosis of tuberculosis with cavities reporting themselves with symptoms may be studied and followed up. This study is of national importance and on which our knowledge is insufficient. It has been observed that many patients seeking assistance at various hospitals and dispensaries for infections with pulmonary

symptoms are diagnosed tuberculosis on the basis of single miniature X-ray. Their sputum is repeatedly negative for AFB. There is no other positive finding except positive X-ray shadow. It has been argued that a high proportion of these patients have no tuberculosis at all. It would be therefore desirable to make a detailed study of such cases.

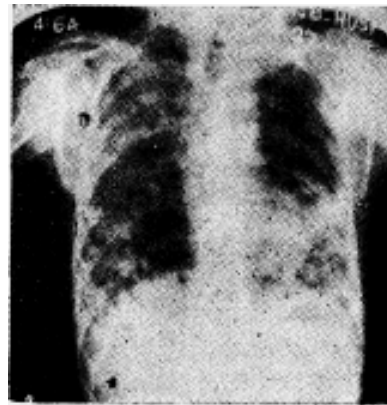
With increasing industrial activities all over the world pulmonary lesions caused by inhaled dusts fumes and gases have become steadily more numerous. Several of these Pneumopathies are well known though previously rather rare entities. Hyderabad, capital of Andhra Pradesh located in the heart of India, has good industrial activity in and around. There are among others asbestos, cement, metal works and foundries. Several new industrial enterprises are being set up. A workman has constant physical contact with his environment which might include dust, vapour, fumes and gas etc. and often causes damage to respiratory system.

The following four cases illustrate some of the varied clinical roentgenologic and histologic findings in Pseudotuberculous conditions of lungs.

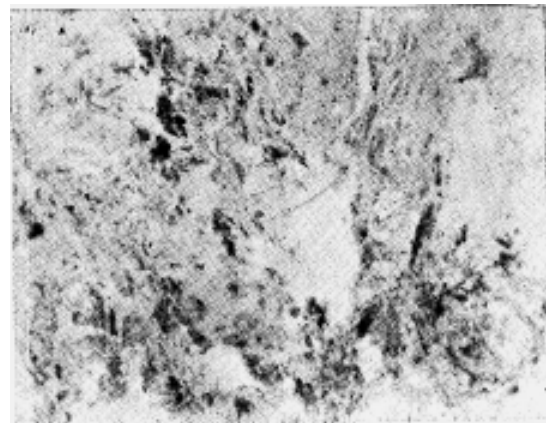
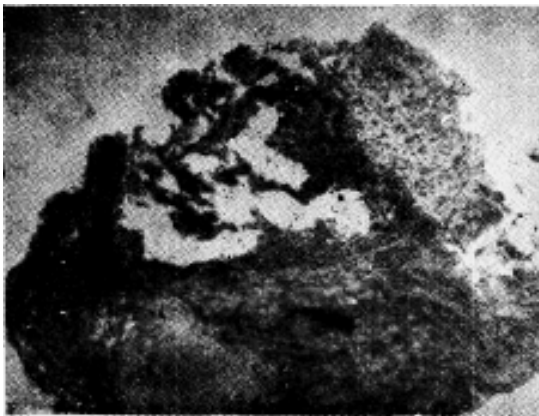
### Illustrative Cases

#### Case I

*M. L.* :—A 40 years old labourer in a metal factory was admitted in the TB Hospital, Hyderabad with cough expectoration and loss of weight. He had been entirely well until 3 months prior to admission, when he developed persistent cough and mild breathlessness. His



past history revealed that he had never had any previous serious illness. The X-ray chest of 27-10-66 was read as Bilateral Tuberculosis. The sputum examined repeatedly in October and November 1966 did not show tubercle bacilli. The bronchial aspirate of 30-10.66 cultured had no growth of TB. A detailed accurate occupational history was taken in chronological order from his adolescence to present job particulars together with an inventory of articles and material used at his employment. It was found that this man had been working at a furnace in a metal factory for 9 years, exposing the painted iron pipes to heat and thus he was constantly in contact with the hot smoke that jets out of the furnace hole. It is interesting to note that the furnace wall was constructed with a special type of brick made of silica and it is presumed that the hot smoke is silicious gas generated from the brick wall of the furnace.



Needle lung biopsy revealed silicotic nodules and the nodule is made up of whorls of collagen arranged concentrically like the layers of an onion. This hyalinized nodule is studded with greyish brown particles which may be of silicon dioxide, probably an etiologic agent. There is no caseation necrosis or giant cells. The diagnosis of Penumoconiosis compatible with silicosis is given. The presence of silica in the lung tissue was detected under a polarizing Microscope. The lung section exhibited phenomenon of parallel extinction to silica.

#### Case II

*A. A.* :—A male of 32 years dusky looking labourer was referred to TB Hospital as a case of P.T. His chief complaint was cough and loss of weight for 3 months. The X-ray of 19-1-67 shows bilateral multiple foci occupying

the lungs. The sputum and L.S. exam, for TB was negative both by D/S and Culture. The Mantoux test was 10 mm diameter. Occupational history : He worked 6 hours every day for about 10 years at a Quartz grinding factory as a labourer and was exposed , to Silica dust that was raised out of the pulverizing mill.

Open biopsy of the lung was done by making 2" of intercostal incision over the left 6th space under local anaesthesia. The free edge of lung was grasped and a small wedge was resected, a few stitches were made and the wound was closed. A chunk of lung tissue excised was divided into 3 bits. *First bit* was macerated and cultured for AFB and the result was *No growth* of Tubercle Bacilli. The *Second bit* for Histopathological study revealed diffuse fibrosis and marked proliferation of the interalveolar septa. In some areas collageous bundles composed of dense fibrocellular tissue is seen. There are scattered foci of brownish and black pigment embedded in the fibrous

## PSEUDOTUBERCULOUS CONDITIONS OF LUNGS

stroma. There is no evidence of Tuberculosis. The *Third bit* was submitted for the estimation of silica content. The tissue had been strongly ignited at a Temp of 1000°C in a platinum dish. Thereafter it was fused with NaOH in a nickel crucible taken into solution by HCL. The SiO<sub>2</sub> content was estimated calorimetrically by the molybdate blue method. A reagent blank has been run along with the specimen, as control. The SiO<sub>2</sub> content of the lung tissue was found to be 5 PPM, which is diagnostic of silicosis.

### Case III

Mrs. K.B. aged 20 years was admitted on 8-8-64 at TB Hospital as a case of P.T. A general practitioner treating her as a case of Typhoid, when she complained of irritation of throat and cough re-examined her in detail and detected bilateral axillary nodes, and labelled her as a case of P.T. after Chest X-ray.

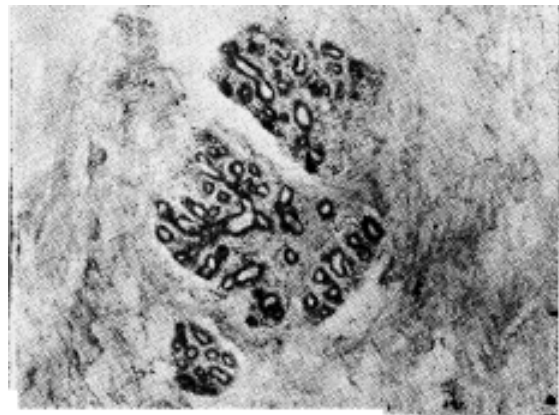
On examination at Hospital: A young healthy looking lady, much perplexed as she was told she had tuberculosis. (Clinical examination of respiratory system NAD). But bilateral axillary



lymph nodes were palpable and soft. X-ray of 8-8-64 = streaky shadows, left upper lobe. After some time she developed hoarseness of voice and the ENT specialist taking into account the streaky shadow in the X-ray and axillary lymph glands made a diagnosis of early case of Kochs laryngitis and advised anti TB drugs. Since sputum culture was TB negative, she was treated with throat gargles, Vit C tabs and a course of Penicillin. This therapy though relieved hoarseness the irritation of throat continued. However the axillary lymph glands thought to be tuberculous and Kochs laryngitis SM 1 Gm and INH 400 gm daily were given for 2J months. On a review there was no change in



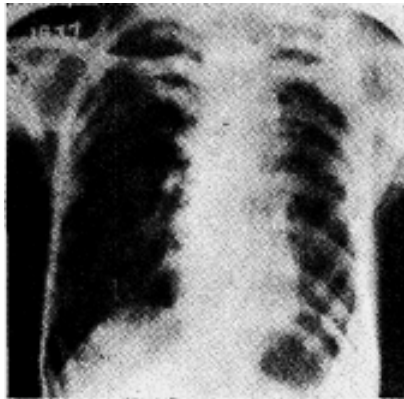
the size of axillary mass or appreciable change of throat condition. In all 17 D/S examinations and 5 cultures were TB negative. Since the patient was anxious to get her axillary glands removed, under local anaesthesia, the left axillary mass was excised and the histopathological examination revealed structure of mammary lobule composed of ramifications of terminal tubules which are lined by one or two



layers of developed secretory epithelium etc. A diagnosis of mature lobule of breast was made.

*Case IV*

G.N: 55 years male agriculturist, tall and thin with slight hunchback walking with dragging gait was referred to TB Hospital as a case of P.T. His main complaint was cough with expectoration for 4 months. Also he had pains all over the body. A year prior to present admission he had stomach ache and shooting pains in the lower limbs, which lasted for some



months and local treatment gave him relief. A few days after admission he developed numbness in the lower limbs along with pain and limitation of movements in lower limb joints. Examination revealed bony excrescences in the upper and lower parts of tibia on both sides. Movements at spine and knee were limited. The jerks at knee and ankle were slightly exaggerated. Rectal exam=Normal Prostrate. Blood picture, Liver function tests, Fractional



Test meal and the Bone marrow haemogram were normal. The X-ray of long bones 2" above the ankle joint and wrist joint revealed extensive thickening of radius-ulna and tibia-fibula. The bones were dense and a diagnosis of Fluorosis was made after a special look at the osteosclerotic changes in the 3rd left rib, which shadow was thought to be tuberculous patch. The water from his Village Anivonipalle had a fluorine concentration of 2 parts per million. A diagnosis of generalized fluorosis was ultimately made.

**Discussion**

The main purpose of presenting these cases after investigation is to bring our attention to the existence of pseudotuberculous conditions of lungs in the community and such if treated injudiciously with anti TB drugs, produce Iotrogenic disease. Owing to the multiplicity of causes in industries the manifestations of industrial chest diseases are variable and many of them resemble pulmonary tuberculosis. The diagnosis of pneumoconiosis presents no difficulty in patients with prolonged occupational history, and X-ray evidence of typical nodulations.

In case No. 1 the history of dust exposure was not obvious, till a detailed job particulars and inspection of the factory furnace was made out. Clearly a simple method of needle biopsy lung for histological and mineralogical evidence as to the presence of silicotic nodulation and the presence of dust, proved to be an invaluable diagnostic acquisition. In case No. 2 even though there is a clear history of prolonged exposure to Quartz dust, the roentgenogram was unlike a silicotic. Estimation of mineral content and histology of the lung tissue revealed it to be a moderately advanced case of fibrosis due to Silicosis. This condition according to modern workers is an autoimmune disease. Silicosis is an important occupational disease to a physician for he may be called at some times to give his diagnosis and often a diagnosis of pulmonary tuberculosis is made leaning too heavily upon the X-ray findings. There is evidence in the past work that silica laden lung tissue predisposes to tuberculosis. With the modern diagnostic and therapeutic methods available it is possible to protect the Pneumoconiotics from tuberculous contagion.

In case No. 3, the axillary mass with streaky shadows in the left upper lobe, cough and laryngitis was thought to be of tuberculous infection till biopsy of left axillary mass revealed it to be ectopic breast. Though the occurrence of accessory breast tissue is less

common, its occurrence in the axilla is more important from the clinical stand-point. It has no nipple or areola but has the same hormonal influences as the main breasts.

Cases of generalized fluorosis as case No. 4 might be a rare visitor to a chest clinic. One should keep in mind cases of patients from endemic areas of fluorosis with chronic Bronchitis and emphysematous lung showing shadows resembling P.T. Careful inspection of bones i.e. ribs in a mass miniature film though impracticable in routine, such shadows should at least be given a perfunctory glance in a radiograph of a case coming from an endemic area of fluorosis for osteosclerosis of the ribs. More details may be obtained by the use of a coned down view by an oblique centred on the affected area with the suspected part as nearly as possible parallel to the film and by using a potter Bucky diaphragm. If such facilities are not available it is better to rely on clinical examination.

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#### REFERENCES

1. Aird, I: A companion in surgical studies, 2nd ed 1958-p 606
2. Bordia, N.L. (1967) Chairman-Expert group. ICMR (TB) Proposals for new studies to be undertaken in the year 1968-69."
3. Bunting (1944). Determination of soluble  $\text{SiO}_2$  in very low concentrations—Industrial and Engineering Chemistry, Annual Edition, Vol 16, page 612
4. Fridodt Moller, C, and Barton. R.M. (1940) Indian Medical Gazette; 75, 607 .
5. Kumar, S.P. et al, Fluorosis in Aden. *Brit. Jou. Radiology.*, Vol, 36, No 427 page 497.
6. Mital, O.P. et al "Friedlander's Penumoma" *Ind. Jou. Chest. Dis.* Vol. VII, No. 2, April 1965
7. Steel, S.J. Hodgkins' Diseases of the Lung with cavitation, *Am.Rev. Resp. Diseases.*, 84:736, 1964.

# PULMONARY TUBERCULOSIS AMONG PREVIOUSLY B.C.G. VACCINATED PERSONS

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## Introduction

Various controlled trials have been performed to assess the protective effect of B.C.G. vaccination, but there have not been many reports on the characteristic features of tuberculosis developing in persons previously vaccinated with B.C.G.

In this article, an attempt is made to study the characteristic features and extent of pulmonary tuberculosis in B.C.G. vaccinated.

## Review of literature

The Medical Research Council (1963) has reported on 48 cases of Tuberculosis in the B.C.G. vaccinated. Majority of them (73%) developed pulmonary tuberculosis and another significant proportion (8 out of 48) developed pleural effusion. Hilar adenitis was seen in only one case. Frimodt-Moller *et al* (1964) did not find any obvious differences between the groups, vaccinated, controls and positives. Pamra *et al* (1967) found a preponderance of primary tuberculosis in the younger age groups as compared to pulmonary tuberculosis in the older age groups. They compared the pattern of disease in the vaccinated and unvaccinated and did not find any differences between the two in any age group. In their series, the extent of pulmonary tuberculosis was significantly less in the vaccinated than in the general patients. Mehrotra *et al* (1967) found that only about 1 % of the X-ray positive tuberculous patients attending their T.B. centre had B.C.G. Scars. Among 25 tuberculous patients with B.C.G. scars, 20 persons (80%) gave a clear history of previous contact. Most of the patients suffered from a fairly extensive disease and none showed minimal infiltrative lesions. Amitava Mitra and Santosh Kumar Mitra (1964) have reported a case of acute millitary cum meningeal tuberculosis in a B.C.G. vaccinated nurse working in a T.B. Hospital.

## Material and observations

At various short intervals during 1964, 1965 and 1967, all consecutive tuberculous patients attending the T.B. Clinic, Govt. General Hospital, Kurnool and newly diagnosed as suffering from pulmonary -and nonpulmonary tuberculosis were questioned regarding B.C.G. vaccination and examined for B.C.G. scars. The number examined are as follows :—

No. of patients without B.C.G. Scars—792

No. of patients with B.C.G. scars — 10

In addition to the 10 cases discovered in the above series there are also 16 tuberculous patients with B.C.G. scars and previous history of B.C.G. vaccination. These are a result of chance discovery in T.B. out patients and T.B. wards during the year 1967 and first quarter of 1968. These are also included and altogether 26 cases in which the extent and type of tuberculous disease is studied are presented. For comparison, the type and extent of disease found in the 792 tuberculous patients without B.C.G. scars are also studied.

Table I presents the Age and Sex distribution of the tuberculous patients both unvaccinated and vaccinated. Table II presents the clinical features of individual cases of tuberculosis among the patients with B.C.G. scars. On perusal of Table II the following features emerge.

- (i) Out of 26 cases examined, 20 persons were found to be suffering from adult type pulmonary tuberculosis
- (ii) Mediastinal (Tracheo bronchical) lymphadenitis was seen in only one case and tuberculous cervical lymphadenitis in another one case.
- (iii) Pleural effusion occurred in 4 cases.
- (iv) Majority of the patients were in the age group 11 to 20 and 24 out of 26 were below 30 years.
- (v) Out of the 20 persons found to be suffering from adult type pulmonary tuberculosis, six (6) patients exhibited a cavity near the hilum on either side. In 5 of them, the hilar cavity was not associated with any upper zone disease and this hilar cavity with some surrounding disease appeared to be the main radiological feature. In the remaining one patient it was associated with bilateral pulmonary tuberculosis. In 4 out of the 6 cases, sputum was positive for A.F.B. by direct smear confirming the tuberculous aetiology of this cavity.

PULMONARY TUBERCULOSIS AMONG PREVIOUSLY B.C.G. VACCINATED PERSONS

TABLE I

*Age and Sex Distribution of the Tuberculous Patients Both Unvaccinated and Vaccinated*

Age group	Unvaccinated			Vaccinated		
	M	P	T	M	F	T
0-10	6	2	8	3	—	3
11-20	61	43	104	12	3	15
21-30	218	107	325	5	1	6
31-40	172	25	197	2	—	2
41-50	80	16	96	—	—	—
51-60	56	2	58	—	—	—
61 and above	3	1	4	—	—	—
Total	596	196	792	22	4	26

TABLE II

*Clinical Features in Individual Vaccinated Tuberculous Patients*

S. No.	Name	Age	Sex features	Radiological	Type of disease	Extent of disease	Sputum result	Contact history and onset of disease	Period between vaccination and onset of disease
1.	A.N.	39	M	Minimal lesion Rt. upper zone	P.T.	I	Neg.	—	7 Years
2.	Na.	40	M	Discrete infiltrations Lt. upper zone	P.T.	I	Neg.	—	10 Years
3.	J.V.P.	10	M	Pleural effusion Rt. side	P.E.	—	Neg.	—	5 „
4.	Ma.	16	M	Bilateral P.T. with cavity Rt. upper zone	P.T.	III	Positive	—	vaccinated twice — last two years back
5.	L.R.	25	M	Infiltrations Rt. upper and Mid. zones	P.T.	II	Neg.	—	8 Years
6.	Sr.	12	M	Infiltrations Lt. upper and Mid. zones	P.T.	II	Positive	—	2 Years
7.	K.R.	8	M	Pleural effusion Lt.	P.E.	—	Neg.	—	3 Years
8.	Ve.	10	M	Segmental shadow Lt. upper zone with mediastinal and Hilar adenitis	Primary	—	Neg.	—	2 Years

(Continued from page 15)

S. No.	Name	Age	Sex	Radiological features disease	Type of	Extent of	Sputum result onset of	Contact history	Period between vaccination and disease
9.	V.S.	22	F	Cavity Lt. Hilum with irregular patchy shadows I.t. mid and lower zones	P.T.	III	Positive	—	8 Years
10.	C.S.	18	M	Cavity Lt. Hilum with infiltration	P.T.	II	Positive	—	4 Years
11.	M.S.	16	M	Bilateral infiltrations with cavity Rt. upper zone	P.T.	III	Positive	—	3 Years
12.	Pu.	20	M	Bilateral infiltrations with cavity Lt. mid zone	P.T.	II	Positive	—	4 Years
13.	Si.	15	F	Infiltrations Lt. upper, mid and lower zones	P.T.	III	Positive	—	8 Years
14.	Ya.	18	F	Cavity Rt. Hilum with infiltrations—also associated T.B. meningitis	P.T.	III	Neg.	Father is a P.T. patient	10 Years
15.	JO	20	M	Bilateral infiltrations with cavity Rt. upper zone	P.T.	III	Positive	No	3 Years
16.	Au.	27	M	Cavity Rt. hilum with infiltrations	P.T.	II	Neg.	Wife suffering from P.T.	8 Years
17.	M.R.	20	M	Bilateral advanced P.T. with cavity Lt. Hilum	P.T.	IV	Positive	No	10 Years
18.	S.H.B.	25	M	Bilateral infiltrations with cavity both upper zones	P.T.	III	Positive	No	10 Years
19.	S.R.	25	M	Pleural effusion Lt. side	P.E.	—	Neg;	Room-mate had P.T.,	2 Years
20.	V.R.	23	M	Infiltrations with cavity Rt. Hilum	P.T.	II	Positive	No	7 Years
21.	Na.	12	M	Chest clear TB cervical adenitis	Primary	—	—	—	4 Years
22.	R.B.	16	F	Infiltrations Lt. upper zone	P.T.	I	Neg.	—	12 Years
23.	N.R.	18	M	Bilateral infiltrations	P.T.	II	Neg.	—	10 Years
24.	K.S.	16	M	Pleural effusion Rt. side	P. T.	—	Neg.	—	Vaccinated 3 times— last 1 year back
25.	A.H.	22	M	Bilateral infiltrations	P.T.	II	Positive	—	7 Years
26.	Th.	18	M	Infiltrations Lt. side.	P.T.	II	Positive	—	Vaccinated twice— last two years back

P.T. Pulmonary Tuberculosis of the Adult type,  
P.E, Pleural effusion

TABLE III

*Pattern of Tuberculous Disease Among the Unvaccinated*

Type of disease	Number of Patients in various Age Groups							Total
	0—10	11—20	21—30	31—40	41—50	51-60	61 and above	
Pulmonary tuberculosis	1	96	318	194	96	58	4	767
Primary T.B. with history mediastinal adenitis	5	2	1	—	—	—	—	8
Pleural effusion	1	4	6	2	—	—	—	13
Tuberculous cervical adenitis	1	1	1	—	—	—	—	3
Miliary tuberculosis	—	—	—	—	1	—	—	1
Others	—	—	—	—	—	—	—	—

Tables III and IV present the pattern of tuberculous disease among the unvaccinated and vaccinated respectively in relation to age. Table V represents a comparative between the two groups and is expressed in percentages.

It can be observed that,

1. Primary tuberculosis and its attendant complications are more common in the age group 0—10 in both the vaccinated and

TABLE IV

*Pattern of Tuberculosis Disease among the Vaccinated*

Type of disease	Number of Patients in various Age Groups							Total
	0-10	11-20	21-30	31-40	41-50	51-60	61 and above	
Pulmonary tuberculosis	—	13*	5	2	—	—	—	20
Primary tuberculosis with history Mediastinal adenitis	—	—	—	—	—	—	—	1
Pleural effusions	2	1	1	—	—	—	—	4
Tuberculosis cervical adenitis	—	1	—	—	—	—	—	1
Miliary tuberculosis	—	—	—	—	—	—	—	—
Others	—	1*	—	—	—	—	—	1*

\* P.T. with meningitis (included in pulmonary tuberculosis)

TABLE V Pattern of Disease among unvaccinated and vaccinated expressed As Percentage

Type of disease	0—10 years		11—20 years		21—30 years		31—40 years		41—50 years		51—60 years	
	U.V.	V	U.V.	V	U.V.	V	U.V.	V.	U.V.	V	U.V.	V
Pulmonary tuberculosis	12.5%	—	93.2%	86.66%	97.5%	83.3%	99%	100	99%	—	—	100%—
Primary TB with history Med. Adenitis	62.5%	33.3%	1.94%	—	0.3%	—	—	—	—	—	—	—
Pleural effusion	12.5%	66.6%	3.9%	6.66%	1.84%	16.6%	1%	—	—	—	—	—
TB cervical adenitis	12.5%	—	1.94%	6.66%	0.3%	—	—	—	—	—	—	—
Miliary Tuberculosis	—	—	—	—	—	—	—	—	—	1%	—	—
Others				6.66%*								

\* A case of pulmonary Tuberculosis with Tuberculosis meningitis included in both categories.

TABLE VI

The frequency of hilar cavity among the vaccinated and unvaccinated

Group	Total No. pulmonary tuberculosis cases	Hilar cavity	Hilar cavity with bilateral P.T	Isolated Hilar Cavity
Vaccinated	20	6 (30%)	1	5 (25%)
Unvaccinated	769	19 (2.5%)	13	6 (0.8%)

unvaccinated. In the older age groups, pulmonary tuberculosis of the adult type predominates in both groups.

2. Pleural effusions are relatively more common in the vaccinated group (15.4%) than in the unvaccinated group (1.64%).

3. Table VI gives the incidence of hilar cavity among the vaccinated and unvaccinated. As observed from the table, hilar cavity is seen in 30% of the cases of adult pulmonary tuberculosis in the vaccinated, whereas it is seen in only 2.5% of the cases of adult pulmonary tuberculosis among unvaccinated. A single hilar cavity without upper zone disease is seen in 25% or 1/4th of the cases of adult pulmonary tuberculosis among the vaccinated, whereas it is extremely rare in the unvaccinated group (less than 0.8%). Figures I, II, III and IV show x-ray photos of the individual cases in which hilar cavity is seen.

Cases of pulmonary tuberculosis in both groups were divided into 4 stages depending on the extent of disease. The size of cavitation was not taken into account, but cavity, if present, was included in II, III or IV stages only. Generally the national classification is adhered to, but for purposes of this study, stage III disease is divided into stage III and IV.

I Stage :—Disease occupying not more than one x-ray zone. If bilateral, total extent not more than 6ne zone. There should be no obvious cavity.

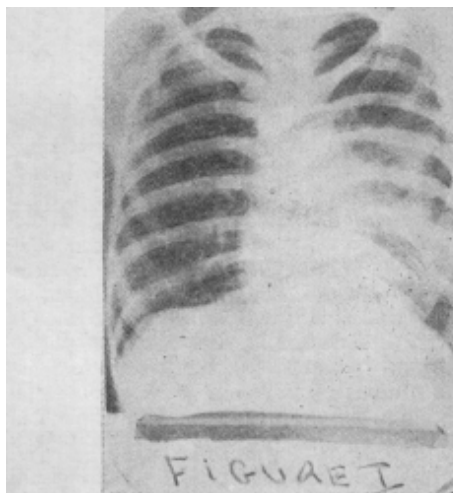
II Stage—Extent of disease more than one zone, but less than two zones.

HI Stage :—Extent of disease more than two zones but less than three zones. If bilateral total extent should not be more than three zones.

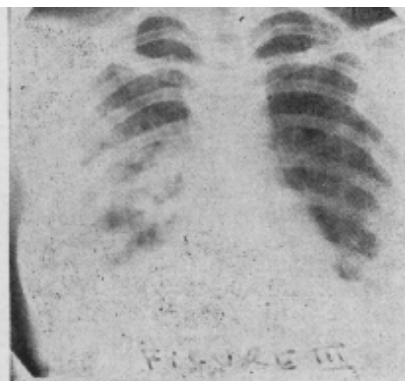
IV Stage ;— More extensive than III Stage.

**TABLE VII**  
*Distribution of case of pulmonary tuberculosis among the unvaccinated into various stages according to the extent of disease*

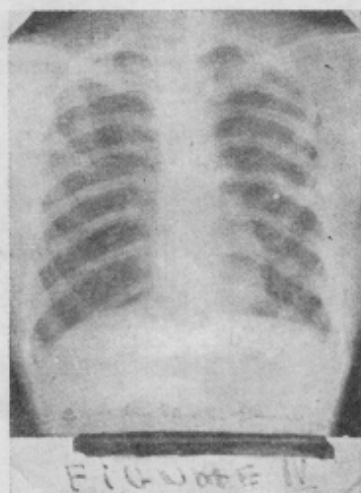
Group	Stage I	Stage II	Stage III	Stage IV	Total
Unvaccinated	79 (10.3)	263 (34.3%)	258 (33.6%)	167 (21.8)	767
Vaccinated	3 (15%)	9 (45%)	7 (35%)	1 (5%)	20



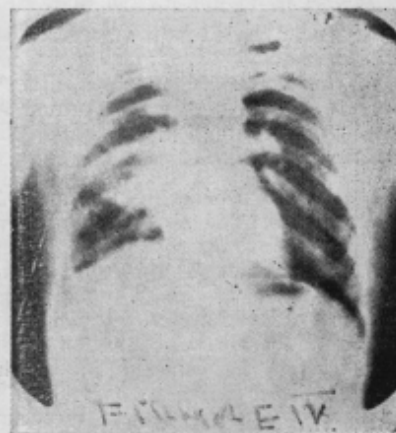
**Fig. I**  
*Case No 9 : V.S. Female aged 22 years, X-ray chest showing cavity left hilum with surrounding disease. Upper zones free. Sputum is positive for A.F.B. B.C.G. vaccinated 8 years prior to the onset of disease.*



**Fig. III**  
*Case No. 14 : Ya. Female aged 18 years. X-ray chest showing cavity right hilum with surrounding disease. Upper zones free. Sputum is negative for A.F.B. Patient has also associated T.B. Meningitis. B.C.G. vaccinated 10 years prior to the onset of disease,*



**Fig. II**  
*Case No 10 : C.S. Male aged 18 years. X-Ray chest showing cavity left hilum. Sputum is positive for A.F.B. B.C.G. vaccinated 4 years prior to the onset of disease.*



**Fig. IV**  
*Case No. 16 : Au. Male aged 27 years, X-ray chest showing cavity right hilum with surrounding disease. Upper zones free. Sputum is negative for AFB. Radiological clearance obtained with anti T.B. treatment. Wife is also found to be suffering from Pulmonary Tuberculosis. Both points are in favour of a Tuberculosis aetiology of the cavity.*

This included all the florid extensive types, the so called far advanced or bilateral extensive disease,

Table VII shows the distribution of the four stages in both groups. It can be observed that on the whole the extent of disease is some what less in the vaccinated than in the unvaccinated. Stage IV disease, the so called bilateral extensive florid types of lesions are fairly common in the unvaccinated group (21.8%) whereas in the vaccinated, they form only a small portion (5%). Only one case showed bilateral extensive disease.

### Discussion

The relative frequency of the pleural effusion and the extreme rarity of mediastinal (tracheo bronchial) lymphadenitis in the vaccinated noted in this study has also been observed by the M.R.C. (1963). Two out of the four pleural effusions reported in this study have occurred in the age group 0 — 10. In the unvaccinated only one out of 13 cases reported has occurred in that age group. Generally the incidence of pleural effusions is extremely low in the 0—10 age group and yet they have occurred with some frequency in the vaccinated. It is possible that the original allergy and immunity conferred by B.C.G. vaccination might have disappeared. Pleural effusion in such cases may be an exaggerated reaction to a reinfection primary complex (a second primary infection after the original allergy due to B.C.G. has disappeared) comparable to an anamnestic reaction.

A cavity near the hilum has occurred with a fairly characteristic frequency in the vaccinated group in this series. A far larger survey than the present one has to be performed before determining the actual frequency and the true importance of this hilar cavity.

As is well known, hilar cavities are located in the apical segment of the lower lobe. Pagel (1953) believes that a cavity in the apical segment of the lower lobe is a sequel to a breaking down primary focus. Actually out of the six hilar cavities, 5 are not associated with any upper zone disease, indicating that pulmonary tuberculosis has started in the hilar region. Such hilar cavities, unassociated with upper zone disease are extremely rare among the unvaccinated (only 2.5 in this series), in whom an infraclavicular cavity appears to be a common feature. In a series of 154 minimal to moderately advanced cases of pulmonary tuberculosis examined for the purpose of this study, an infraclavicular cavity is observed to be present in 80 cases. The infraclavicular cavity is the result of a breaking down Ass-

mann focus which Pagel 1964 believes to be an endogenous focus in the majority. On the other hand, the hilar cavity appears to have a different pathogenesis. In all the six (6) cases where hilar cavity has occurred the period between the B.C.G. vaccination and the onset of disease has been fairly long. In 5 cases it is between 7—10 years and in 1 case 4 years. This long period suggests that the subjects might have become tuberculin negative, by the time they are naturally infected. This normal infection might have resulted in a primary focus, which on breaking down gave rise to hilar cavity. In fact, the association of tuberculous meningitis in one case, suggests that the hilar cavity in that case might be a breaking down primary focus. However, a breaking down super infection (natural infection occurring while the B.C.G. allergy is still present) focus cannot be ruled out.

It has already been observed that the extent of disease was somewhat less in the vaccinated than in the unvaccinated. But taking into consideration Stage I, II and III, the differences were not marked. However, Stage IV or Bilateral extensive disease is very common in the unvaccinated, whereas in the vaccinated it forms only a small proportion (5%). However, far reaching conclusions cannot be drawn as the series is very small.

### Summary

The pattern and extent of tuberculous disease is studied in 26 patients with B.C.G. scars and previous history of B.C.G. vaccination. For comparison, the pattern and extent of tuberculous disease among 792 unvaccinated tuberculous patients were also studied. The differences found were enumerated and discussed.

### REFERENCES

1. Amitava Mitra and Santosh Kumar Mitra : 1964 ; Indian Journal of Tuberculosis, 156
2. Frimodt-Moller, J. Jacob Thomas and R. Parthasarathy ; 1964 Indian Journal of Tuberculosis, 114
3. Medical Research' Council ; 1963 ; *Brit. Md. J.* ; 1,973
4. Mehrotra, M.L. et al : 1967 ; Proceedings of the Twenty Second Tuberculosis and Chest Diseases Workers Conference, 118
5. Pagel, W., Simmonds F.A.R. and Macdonald, N. 1953 : Pulmonary Tuberculosis, III Edn., 336
6. Pagel, W. Simmonds F.A.H., Macdonald N. and Nassau, E : 1964 : Pulmonary Tuberculosis —IV Edn., 226
7. Pamra, S.P., Jaswant Singh and Mathur, G.P. : 1967 ; Proceedings of the Twenty Second Tuberculosis and Chest Diseases Workers Conference, 107

## TUBERCULOSIS OF THE BREAST

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Tuberculosis of the breast is a relatively rare condition when compared with frequency of tuberculous infection and tuberculous disease in other organs of human body, yet it is not so uncommon among the diseases of the breast (Morgen 1931).

Astley Cooper (1829) was the first to recognize mammary tuberculosis as a clinical entity. Nicholson and Gillespie (1941) consider the incidence of tuberculosis compared with all breast lesions to be 0.54%. Mcghee and Schmeisser (1935) gave a figure of 1.87%.

The disease is not only limited to the female sex, but as many as 20 cases of tuberculosis of breast in the males have been recorded in the literature.

The Incidence of involvement of the right breast is more than the left, but cases having bilateral involvement have also been reported, one of the cases reported in the following text is with bilateral involvement.

The Incidence is more amongst married women, one of the cases reported in this text is in an unmarried girl. Marriage state with consequent puerperium and lactation play an important part as a predisposing factor in breast tuberculosis. Large majority of the women are between the ages of 20 and 50, when the breasts are most active and that is the age that mammary tuberculosis occurs with great frequency.

Two main varieties have been described, (a) *Primary type* in which there is no evidence of tuberculous disease elsewhere in the body and (b) *Secondary type* in which there is evidence of tuberculous lesion elsewhere such as in the lung, pleura, lymph node or bone. Pathologically, the various lesions can be grouped under :

*Nodular Variety* :—Characterized by the formation of a circumscribed lump of various size in the breast, this may undergo caseation and eventually an abscess forms leading to sinus formation in the overlying skin.

### Case Report

Female P. aged 18 years unmarried admitted on 18.1.68 with the complaints of fever, cough with expectoration and loss of weight duration three months.

*General Physical Examination* showed an under-nourished patient with poor general condition. There was no abnormal findings of



involvement of any system except a few discrete glands in the right neck.

*Bacteriological Examination* of sputum was negative for A.F.B. by three consecutive Direct Smears and by culture of a 24 hours collection.

*X-ray Chest* showed miliary shadows occupying both the parenchymal fields with obliteration of the Costophrenic sinus right and thickening of the left pleura. There was evidence of enlarged Hilar and Paratracheal glands both sides.

The patient was advised to have daily one gram of streptomycin and 300 mgm. of Isoniazid with vitamins! In spite of antimicrobials the patient was having a daily temperature range of 100 to 101 °F on 8.4.68. She was advised to have 10 gm PAS alongwith 300 nigs of Isoniazid as she started complaining of mild vertigo. On 26.4.68 patient complained of a swelling in the right breast which was apparently there for about a month and was gradually increasing in size.

*Local Examination* revealed a swelling of the size of a walnut which was fairly discrete and it was localized in the upper outer quadrant of the right breast. The skin was slightly mobile and tender.

The total W.B.C. count was 11000 and the differential count was 77% Polymorphs, 22% Lymphocytes and 1% Eosinophils. She was advised to have streptopenicillin injections daily in addition to the antimicrobials she was already having. In spite of treatment the swelling continued to increase with involvement of the overlying skin" and the mass becoming slightly adherent, on 4.6.68, the abscess was aspirated and pus was cultured both for Gram positive and A.F.B. which was subsequently found positive for A.F.B. in the 4th week.

On the 10th day of aspiration, an ulcer developed at the site of aspiration, through which lot of cheesy caseous material came out.

On 27.7.68, another mass developed in the left breast which continued to increase and it ulcerated at two spots through which lot of caseous cheesy material also came out.

*Sclerosing Variety* : A circumscribed lump develops which is hard in consistency owing to excessive fibrous tissue formation. This is generally seen in older patients.

*A typical Variety*. Consists of a ulcer which develops in the skin near the nipple. This is followed by formation of nodules later on. A subcutaneous lesion develops which resembles a furuncle or a vesiculated pimple forms with indurated base with caries of the ribs or the costochondral junction underlying the breast and it may point through the breast.

### Case Report

Female S.K. aged 20 years was admitted on 27.4.65 with the complaints of an ulcer around the right breast since three months. There was a history of low grade fever and cough which was nonproductive of a duration of one and a half month.



*General Physical Examination* of the patient showed an average nourished patient. There were no abnormal findings of involvement of any system.

*Local Examination* of the breast showed an ulcer, irregular in appearance of about 6 cm in diameter occupying the upper and outer quadrant of the right breast. The margins of the ulcer were slightly indurated and its base covered with necrotic material. There was slight serous discharge from the involved area. On Palpation there was slight tenderness of the underlying rib. No axillary glands were palpable.

*X-ray Chest* showed no apparent evidence of any disease of the lung parenchyma but there was necrosis of the anterior end of the 4th rib. Sputum and smear discharge from the ulcer were both negative for A.F.B. by culture examination, but Gram positive cocci were present. Kahn test was negative.

The patient was advised to have daily injection of one gram streptomycin and 300 mgm of Isoniazid.

On 13.5.65 under local anaesthesia a Paramammary semicircular incision was given in the inferior fold of the right breast and the anterior end of 4th rib resected. Local palpation of the third and the fifth rib showed roughening of the periosteum and an abscess was found localized in the sub periosteal plane which was incised and drained. The length of the third and fifth rib which were underlying the roughened periosteum were also resected sub periostially. The ulcer was cleansed of its necrotic material and wound closed. The post operative course was uneventful. Histopathological report of the necrotic material and the ribs showed tubercular pathology of the breast with involvement of the rib. The patient was discharged on 21.6.65 with the advice to continue antimicrobials.

*Pathogenesis* : (a) The organism may gain entrance through ducts of the nipple or through an abrasion in the skin, but this is not very frequent, (b) Haematogenous dissemination may occur, although Nagashima (1925) investigated 34 patients who died of miliary tuberculosis. Studying the breast tissue microscopically by smear and guinea pig inoculation, but was unable to demonstrate any involvement. Raven (1949) quoted a case where multiple tuberculous lesions developed at long intervals in widely separated parts of the body and it is assumed that the tubercle bacilli were transported by the bloodstream, (c) Many authors have stressed the importance of infection by the lymphatics system, the primary lesion being in the cervical, axillary or mediastinal tuberculous glands, (d) The breast is affected by retrograde infection. The breast may be involved from underlying tuberculosis of the sternum, Costochondral junction or the rib.

*Symptoms*: The most frequent presenting symptom is a lump in the breast which is often painless and discrete. When caseation is present the border of the lump is well defined. Involvement of the overlying skin may lead to fixation and dimpling with retraction of the nipple or it is stretched and red or it may lead to sinus formation. According to Morgen it may occur in as many as 50%. Tubercle

bacilli may be demonstrated in the discharge. Enlargement of axillary glands is often present and this may precede the development of disease in the breast.

A radiological examination of the chest should be made as a routine.

Grausmann and Goldman found pulmonary tuberculosis in 12 to 16% of all cases or tuberculosis may coexist with the carcinoma of breast.

#### REFERENCES

1. Tuberculosis of Breast, Ronald W. Raven. *Brit. Med. Jour.* Page 734. *Out.* 1940.
2. Grausmann, R.-I. and Goldman, K.L. *Amer. J. Surg* 67, 48, 1945
3. McGehee, J.L., and Schmeisser, H.C. *Ibid.*, 28, 461. 1935.
4. Morgen M. *Surg. gynec- Obstet*, 53, 593. 1931
5. Nagashima, Y. *Arch. Path. Anat*, 254, 184. 1925.

## APPEARANCE OF SPONTANEOUS PNEUMOTHORAX DURING CORTICOSTEROID THERAPY

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Spontaneous pneumothorax is not an unusual complication of pulmonary tuberculosis. Of late, it has been reported to be more frequent in cases receiving corticosteroid therapy (Armstrong and Mitchell 1960, British Tuberculosis Association 1961, Segarra and Sherman 1962, Imari 1962, Goldman 1962 and Khanna 1963). However, the reports on this complication are still few and far between and most of the reports refer to clinical description of isolated cases.

During the last 4 years we have observed five cases of spontaneous pneumothorax occurring during corticosteroid therapy for pulmonary tuberculosis. These cases are presented below.

### Case Reports

1. N. J., housewife, aged 16 years was admitted to our hospital on 20.4.63 with history of suffering from lowgrade pyrexia and cough for the last one year and diarrhoea for the last one month. There was no history of having come in contact with a tuberculous case. She was found to be considerably emaciated. The chest x-ray revealed a picture of miliary tuberculosis. The sputum was found to be positive for acid fast bacilli. She was put on streptomycin (1 G. I. M. I. once a day), Isoniazid (200 mgms per day by oral route) and prednisolone (5 mgms 4 times a day orally). The initial response to treatment was satisfactory. However, a routine skiagraphic check up after one month revealed the presence of asymptomatic pneumothorax on left side. It was believed to have resulted as a consequence of prednisolone therapy. Therefore, later was gradually tapered off. Within next 6 weeks left lung gradually expanded fully.

However, she developed high swinging temperature and clinical evidences of tuberculoxemia despite antituberculosis therapy. Hence it was decided to restart prednisolone therapy. (5 mgms 4 times a day by oral route). 2 weeks after the initiation of the therapy, the patient complained of pain in right side of chest, dry hacking cough and breathlessness. Clinical and radiological examination confirmed the presence of pneumothorax on the right side. Prednisolone was again tapered off, Air absorbed gradually from the pleural cavity during subsequent 6 weeks.

The patient was discharged from our hospital in a fit state. She has been followed up now for nearly four years, without any evidence of recurrence of pneumothorax.

2. P., aged 16 years, a housewife, was admitted to our hospital on 6.2.64 with history of fever with rigor, cough, loss of weight, and loss of appetite for the last 3 months and amenorrhoea for the last 2 months. On admission, she was found to be in low general condition. Clinical examination of the chest revealed harsh vesicular breathing both sides of chest accompanied by coarse crepitations. Chest x-ray revealed the presence of miliary tuberculosis of lungs. The sputum was found to be positive for acid fast bacilli. She was put on streptomycin, Isoniazid and PAS in standard dosage (Streptomycin 1. G. I. M. I once a day, Isoniazid 300 mgms per day by oral route and PAS 10 G per day by oral route). Besides, due to low general condition, we decided to add prednisolone (5 mgms 4 times a day) to her therapeutic regimen.

Her course was uneventful till 23.3.64, when she developed cough, pain in left chest and breathlessness. A chest x-ray confirmed the presence of spontaneous pneumothorax (left side). It was decided to gradually taper off prednisolone. By 7th of April 1964, the left lung had expanded fully (while prednisolone was still being tapered off). However on 15th April 1964, when she was still receiving 5 mgms of prednisolone per day she developed pneumothorax on right side. Therefore, prednisolone was abruptly withdrawn at this stage.

However, now the toxæmic symptoms started increasing and her general condition again started deteriorating. Therefore, on 23.4.67 prednisolone was again started. Again on 18.5.64, while she still had a persistent pneumothorax on right side, she developed another pneumothorax on left side. At this stage it was decided to stop prednisolone completely.

Her general condition, thereafter, started improving and both of her lungs expanded fully. She was discharged within 2 months in a fit state from the hospital.

3. C. S. aged 30 years, a housewife, was admitted to our hospital on 2.9.65 with history

of pyrexia off and on for 6 months and cough, breathlessness, loss of weight and loss of appetite for the last 2 months. She had a history of having undergone spontaneous abortion 2 months back. On admission she was found to have toxæmia, anemia and emaciation. Chest examination revealed harsh vesicular breathing with sibilant rhonchi and coarse crepitations, distributed equally on both sides of chest. Chest x-ray revealed evidences of miliary tuberculosis. Sputum was found to be positive for acid fast bacilli. She was kept on Streptomycin (1 G. I. M. I. once a day), Isoniazid (300 mgms per day by oral route) and prednisolone (5 mgms four times a day).

On 14.9.65 she complained of pain in right side of her chest. She was found to be breathless. Clinical and radiological evidences confirmed the presence of pneumothorax on right-side. It was decided to taper off prednisolone. However, with reduction in its dose, evidences of tuberculoxæmia started appearing. Therefore, it was decided to continue prednisolone therapy despite pneumothorax.

The patient registered an uneventful recovery. Right lung expanded in next 6 weeks despite prednisolone therapy.

4. M. a housewife, aged 21 years, was admitted to our hospital on 15.9.66 as a case of bilateral pulmonary tuberculosis. Chest x-ray revealed infiltrations (productive, bronchogenic type) in both upper and middle zones and a cavity (4 cm in diameter) in right upper zone. The sputum was found to be positive for acid fast bacilli.

She was treated with streptomycin (1 G. I. M. I. once a day), Isoniazid (300 mgms per day orally) and thioacetazone (150 mgms per day by oral route). The response to this regimen of treatment was unsatisfactory. Therefore on 30.11.66 her therapeutic regimen was changed over to triple drug therapy (Streptomycin, PAS and Isoniazid) in standard dosage and prednisolone (5 mgms 4 times a day). Response to this therapy was satisfactory. But on 6.2.67 she complained of breathlessness and pain in her right chest. Clinical and radiographic examination of the chest revealed hydropneumothorax on right side. Although it was decided to taper off prednisolone, her general condition had started deteriorating following this episode. Therefore, prednisolone had to be continued although it was administered now only in dosage of 5 mgms per day. Repeated aspiration of fluid from the chest led to its complete absorption and complete re-expansion of the right lung.

The patient was subsequently discharged in a fit state from the hospital.

5. S. D. a housewife, 20 years of age, was admitted to our hospital on 17.4.67 as a case of bilateral pulmonary tuberculosis. On admission she was found to be anaemic and emaciated. Coarse crepts were audible over both sides of chest. Chest x-ray revealed evidences of multiple cavities in both upper zones. Sputum was found to be negative for acid fast bacilli (Smear examination).

She was put on Streptomycin (1 G. I. M. I. once a day), PAS (10 G per day by oral route), INH (300 mgms per day in a single dose by oral route) and prednisolone (5 mgms four times a day). The response to therapy was satisfactory till 21.6.67 when she started complaining of breathlessness and pain on left side of chest. Clinical and radiographic examination revealed a pneumothorax on left side.

The patient unfortunately left the hospital against medical advice on the same day and could not be traced so far.

### Comments

A study of case records of these cases reveal certain common factors. These are (a) 3 out of 5 cases were suffering from miliary tuberculosis, (b) In 2 cases, where owing to severe tuberculoxæmia corticosteroids therapy was resumed, a recurrence of pneumothorax occurred (case no. 1 & 2). (c) In one instance, expansion of lung occurred despite corticosteroid therapy (case no. 4). (d) Pneumothorax in all the cases appeared within 6 weeks of commencement of therapy, (e) All the cases recorded in our series were females.

Hare (1958) discussing the association between isoniazid and psychosis stated that "the most convincing test for a drug psychosis is that psychosis should remit when drug is stopped and recur when the drug is exhibited again". This statement can be taken to be true for other toxic reactions which can be attributed to any drug. Although it is true that test of recurrence is not easy to perform, because that particular toxic reaction may often necessitate prolonged drug administration. For this reason and for the reason that these toxic reactions may not always be innocuous or simple to manage, such experimental reproduction of drug toxicity in human beings is not advocated. Spontaneous pneumothorax following corticosteroid therapy should also be viewed in the same context. Since only 17 cases had been reported in the world literature

till 1963, and most of these reports referred to single cases, a doubt regarding its causal relationship with corticosteroids could always be entertained. We, in our series of cases, attempted to withdraw corticosteroids immediately this complication was detected. However in case nos. 1 and 2 for reasons of tuberculo-toxaemia and low general condition of the patient, we had to resume corticosteroid therapy. This led to recurrence of pneumothorax on the opposite side, proving therapy that a causal relation did exist between corticosteroid therapy and spontaneous pneumothorax. In that context, these cases are unique in the literature.

It might be argued that since miliary tuberculosis is more likely to be associated with spontaneous pneumothorax, the pneumothorax produced in 3 of our cases (case nos. 1, 2 & 3) could rather be coincidental in nature. However, the sequence of events as 'observed in our case nos. 1 and 2, rule out possibility.

In another case (case no. 4), following the onset of spontaneous pneumothorax, small dosage of corticosteroids (5 mgms per day of prednisolone) was continued without any adverse effect on the progress of the patient and expansion of the lung. It is likely that, in this respect, smaller dosage of corticosteroids are safer as compared to the therapeutic dose.

Occurrence of hydropneumothorax during corticosteroid therapy is still more uncommon. Only three cases have been recorded so far (Brocard et al 1956, McLean et al 1960 and Simmonds 1962). In our case (case no. 4) hydropneumothorax, which regressed following repeated aspiration of fluid, was recorded. It appears, the effusion is likely to follow infection of the pleural cavity by tubercle bacilli (either due to rupture of a tuberculous cavity or a subpleural caseous focus teaming with the organisms). On the other hand, if pneumothorax occurred due to rupture of a subpleural bleb or bullae cavity or a sterile caseous focus, the infection of the pleural cavity would be minimal and hence no effusion or empyema would develop.

Corticosteroids, because of their tendency to suppress the laying down of fibrous tissue, tend to interfere with the natural mechanism of healing of tuberculous granuloma. This makes resolving tuberculous focus more vulnerable to break down. Subpleural foci, under

these circumstances, may end up into spontaneous pneumothorax (Goldman 1962).

In all the cases, belonging to our series, spontaneous pneumothorax occurred within first 6 weeks of therapy. This is probably the period "When the steroids exert their effect but the caseous lesion has not as yet been inactivated by chemotherapy". (Goldman 1962).

Why pneumothorax following corticosteroid therapy should have occurred only in females in our series is not clear. The only record of four cases (Goldman 1962) reveals equal distribution of cases in both the sexes.

### Summary

Case records of five patients, who had developed spontaneous pneumothorax during corticosteroid therapy, have been presented. One of these had developed, in addition, effusion in the pleural cavity. Mechanism of pneumothorax formation and the development of hydropneumothorax have been explained on the basis of anticollagenous action of corticosteroids and infection of pleural cavity\* by tubercle bacilli.

### REFERENCES

1. Armstrong, D and Mitchell, R.S. *Amer. Rev. Resp. Dis.* 82, 551, 1960.
2. British Tuberculosis Association, *Tubercle (Lond)* 42, 413, 1961.
3. Brocard, H., Brincourt, A and Grivaux, M., *Bull. Soc. Med. Hop. Paris* 72 : 967, 1956.
4. Goldman, K.P., *Tubercle (Lond)* 43, 444, 1962.
5. Hare, E.H., *Tubercle (Lond)* 39 ; 90, 1958.
6. Imari, A.J., *Amer. Rev. Resp. Dis.* 86, 425, 1962.
7. Khanna, B.K., *Medical Digest.* 31, 571, 1963.
8. McLean, R.L., Le Maistre, CA., Kubica, G.P. and Corpe, R. F., *Trans. 19th Conf. Chems. Tub. Veterans Administration* Washington P. 138, 1960.
9. Miller, A.B., *Dis. Chest.* 38, 13, 1960.
10. Segarra, P.O. and Sherman, D.S., *Dis. Chest,* 41, 354, 1962.
11. Simmonds, F.A.H., *Tubercle (Lond)* 43; 448, 1962.

## AGRANULOCYTOSIS DUE TO THIA CETAZONE

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### CASE REPORTS

Agranulocytosis is a well recognised but rare complication of antitubercular chemotherapy with Thiace tazone. In majority it proves fatal. Heepe (1949) reported granulocytopenia with conteben (a trade preparation of thiace tazone), Hinshaw and Macdermott (1950) reported an incidence of 0.41% agranulocytosis in their trials in Germany. Pines (1964) came across two cases of Leucopaenia from among his fifteen patients. Japanese co-operative study unit for chemotherapy of tuberculosis (1965) reported an incidence of 1.9% leucopaenia with thiace tazone. Miller et al (1966) reported 2 cases of agranulocytosis with an incidence of 0.2%.

This paper reports below two cases of Agranulocytosis (both fatal), while under treatment for pulmonary tuberculosis with thiace tazone at the Sir G.K.D.T.B. Sanatorium Amritsar. Both the patients had never taken Thiace tazone before nor any other drugs known to cause agranulocytosis.

#### Case No. 1.

K.C. 53 years male was admitted on 14.2.67 as a patient of pulmonary tuberculosis with sputum positive for A.F.B., Examination revealed a moderately built and poorly nourished individual with moderate anaemia. His pulse was 102 per minute, B.P. 125/75 m.m. of mercury, temperature 100°F and he weighed 90 lbs. No lymphadenopathy was detected. Examination of abdomen, cardiovascular and nervous system revealed no abnormality.

#### Investigations : 14.2.67.

Haemoglobin : 10.0 gm. %  
Total leucocyte count : 8000 per c.m.m.  
Differential leucocyte count : P 58%, L 38%,  
: M 2%, E 2%.  
Urine : N.A.D.  
Sputum Smear : Positive for A.F.B.  
X-Ray Chest : Cavitation with  
fibrosis and consolidation in right  
upper & middle zone.

#### Treatment and Progress notes

This patient was one of the 120 patients who formed part of a double blind International co-operative trial to find out thiace tazone toxicity and was being administered one tablet daily, the nature of which was riot known at that time. Later the tablet was discovered to contain I.N.A.H. 300 mgm. and thiace tazone 150 mgm. Within a period of six weeks his cough and expectoration decreased, appetite improved, temperature got settled and his sputum became negative for A.F.B. by smear. However, on the fortieth day of treatment he was noticed to have developed a Perianal abcess, which was drained, and patient put on injection penicilline in addition. His condition showed slight improvement but he continued to experience exhaustion. A peripheral blood count at this time revealed a total leucocyte count of 3200 c.m.m. with total absence of Granulocyte series. The tablet was omitted but the patient died the same day inspite of blood transfusion, steroids, inj. vit B 6, B 12, Folic acid and vitamin C.

Bone marrow aspiration report was—Bone marrow acellular, shows few lymphocytes and normoblasts. No myeloblasts and myelocytes seen. Only one or two polymorphs visible.

#### Case No. 2.

N.R. 48 years. Female was admitted on 3.10.67 as a patient of Pulmonary tuberculosis with sputum positive for A.F.B. She was a confirmed diabetic.

Examination showed a moderately built slight anaemic individual with pulse rate of 100 per minute. Temperature was 100°F and B.P. 130/90 m.m. of mercury. She weighed 90 lbs. No lymphadenopathy was detected. Liver was palpable by 3 fingers below the costal margin. Cardiovascular and nervous system showed no abnormality.

#### Investigations : 3.10.67.

Sputum Smear : Positive for A.F.B.  
Haemoglobin : 10.2 gm. %  
Total leucocyte count : 9200 c.m.m.

Differential leucocyte	
count	: P 70%, L 28%,
	: M 0%, E 2%.
Blood fasting sugar:	: 181 mgm. %.
X-Ray Chest	: Infiltration right upper and middle zones with cavitation in the left upper zone.

### Treatment and Progress Report

Patient was administered injection Streptomycin sulphate 1 gm. along with I.N.H. 300 mgm. once daily and also soluble insulin with remarkable improvement till 6.11.67, when thiacetazone 150 mgm. once daily was added to the regimen. (Unithiben Plain—I.N.H. 300 mgm. Thiacetazone 150 mgm. in 4 tablets). Twenty days after the start of thiacetazone therapy patient developed mild itching over the body and two days later there was reddish macular rash all over including the face with conjunctivitis and stomatitis (a picture resembling Steven-Johnson Syndrome). All the anti tubercular drugs were stopped and patient given Steroids and Tablets Avil 25 mgm. Peripheral blood examination revealed a total count of 7000 c.m.m. with 17% polymorphs, urine sugar was 2%. Blood examination repeated the next day showed a further decline with T.L.C. of 4500 c.m.m. and Polymorphs 5% and Lymphocytes 95%. Patient was given blood transfusion, parenteral steroids, vit B 6, folic acid but without any benefit and the patient expired the same day.

*Bone marrow aspiration* : Marked increase in the number of platelets ; mature neutrophils and proneutrophils forms are very few. Cells of erytheroid series look normal with many type C and type B normoblasts.

### Discussion

Thiacetazone as a tuberculostatic drug was discovered in 1946 ; but discarded because of its serious toxic effects on the bone marrow in the doses used then. But later its combination with Isoniazid, a most powerful drug, made it possible to administer Thiacetazone in a smaller and safe dose. The East African/British Medical Research Council trials (1963) proved it to be relatively non toxic and effective drug when given in a dosage of 150 mgm. along with I.N.H. Its low cost and easy acceptability has been the greatest attraction

for developing countries like India where it has become almost the standard oral treatment.

Apart from rather frequent manifestations of skin hypersensitivity reactions, the rare possibility of Agranucytosis should be kept in mind as in the present series it was 100% fatal. The incidence for our hospital comes to about 0.06%, as these are the only two patients seen from among the total of 3000 patients treated as indoors during the period 1965-1967, since when the drug is in use in this hospital. Even though it is a rare toxic effect its possibility should be kept in mind. Therefore frequent clinical examination and check up of blood is necessary to detect it at an early date.

### Summary

Two cases of Agranulocytosis due to the administration of Thiacetazone are reported. Though it is a rare toxic effect it is serious and hence needs to be looked for carefully.

### ACKNOWLEDGEMENT

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### REFERENCES

1. East African/British Medical Research Council investigation (1963a). Isoniazid with thiacetazone in the treatment of Pulmonary Tuberculosis *Tubercle*, (1960) 44, 393.
2. Goodmann, L.S. and Gillman, A. *The Pharmacological Basis of Therapeutics* 2nd edition. 1960 Macmillan, New York, Page 1962-63.
3. Heepe, F. Mon F. Klinder Heil Kunde. (1949), 97, 349.
4. Hinshaw, H. C.; Macdermot, W. Thiosemicarbozone therapy of Tuberculosis in Humans — *Amer. Rev. Tuberc. Pulm. Dis.* (1950) 61, MS-IS?
5. Miller A.B. ; Wallace Fox and Ruth Tall. An International co-operative investigation into thiacetazone side effects,
6. Pines, A. *Tubercle* (1966), 47, 33. Thiacetazone in British patients.
7. The co-operative study unit in chemotherapy of tuberculosis of National sanatoria in Japan. *Tubercle* (1964) 45, 188, *Tubercle* (1965), 46, 178,

## EASTERN REGIONAL COMMITTEE

### SIXTH CONFERENCE

BY

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The Sixth Eastern Regional Tuberculosis Conference of the International Union Against Tuberculosis was held in Kuala Lumpur (Malaysia) from the 11th to 15th November, 1968.

The Conference was attended by nearly 70 overseas delegates in addition to about 100 from Malaysia itself. The overseas delegates came [from 29 countries, mostly in the eastern region but some from western countries e.g. U.S.A., U.K., France, West Germany, Sweden etc. The Indian delegation consisted of the following :

Dr. R. Viswanathan, Delhi and Mrs. Viswanathan.  
Shri B. M. Cariappa, Delhi and Mrs. Cariappa.  
Dr. M.D. Deshmukh, Bombay.  
Dr. H.B. Dingley, Delhi  
Dr. V.S.J. Rao, Bombay.  
Dr. M.M. Singh, Delhi.  
Dr. S.P. Pamra, Delhi.

Some of the members of the Indian delegation were invited by the Hong Kong Tuberculosis Association to visit Hong Kong and study their activities. A short visit was also paid to Singapore *en route*.

The conference was well managed, well attended and very interesting and educative. The hospitality of the Malaysia Tuberculosis Association was very lavish and the overseas delegates were very well looked after. The Prime Minister of Malaysia, apart from inaugurating the conference gave an 'AT HOME' to the participants.

#### Executive Committee Meeting

The Executive Committee of the Eastern Region of the International Union Against Tuberculosis met on the 10th and finalised the programme of the Conference. Mr. Cariappa was re-elected on the Executive Committee for another term of two years. He was also chosen to serve on the Constitution Drafting Committee. Dr. H.B. Dingley served on the Programme Sub-Committee and the Editorial Sub-Committee. The Council meeting was

held in the afternoon and this meeting ratified the decisions taken by the Executive Committee.

#### Scientific Sessions

A number of papers were presented and a variety of subjects were discussed during the five days. The main emphasis of the papers and discussion was on community aspect of tuberculosis and organisational problems of tuberculosis control in the community rather than problems of an individual patient. Dr. Mahler, Chief of the Tuberculosis Section of the WHO and Dr. Johs. Holm of the International Union Against Tuberculosis discussed the necessity for re-orientation of tuberculosis services to suit the present day requirements of a community programme.

What according to them was more important was not the clinical acumen of the personnel but 'managerial' qualities both of the medical as well as the para-medical personnel especially team leaders who are responsible for the development of an integrated tuberculosis control programme. The desirability of the 'consumer response' being the guiding factor rather than the service based on traditional approach was also stressed. It was also emphasised that the 'vertical' approach adopted by Western countries in the development of tuberculosis services was not worthy of emulation in the developing countries with meagre resources.

The present understanding of the basis of chemotherapy was discussed in a masterly discourse by Dr. G. Canetti with special reference to the bacillary contents of various lesions and the possible reasons of failure of chemotherapy. Dr. Iwasaki of Japan and Dr. Dingley from India read papers on the clinical results of chemotherapy. The subject of chemotherapy was followed by an interesting discussion. The experiences of the Centre about the extent of drug default, likely reasons thereof and how defaulter action is organized were also presented at the conference.

Interesting observation on prevention of drug default and its retrieval were made by a

number of para-medical personnel working in the field in Malaysia. The experiment of supervision of domiciliary treatment, retrieval of drug default and health education through Peace Corps Volunteers (of USA) is being tried with encouraging results in certain areas of Malaysia. The results were reported to be encouraging but it has to be noted that the ratio of volunteer is for 2.5 patients. Whether these volunteers will be able to motivate local population to the requisite extent and train local volunteers to carry on with the good work, when they leave, remains to be seen. This, as was pointed out by me, would be the acid test for this experiment.

The longest session of the conference (lasting 4 hours) was devoted to a panel discussion on the problems of diagnosis and case-finding. Prof. Crofton of U.K. was the Moderator and Dr. Mahler (WHO), Dr. Holm (IUAT), Dr. Sodhy (Malaysia), Dr. Toman (Czechoslovakia), Dr. Porter, (Australia), Dr. Hsing (Taiwan) and Dr. Pamra (India) constituted the panel. The consensus of opinion amongst the panelists was that the methods of diagnosis have to vary with available resources. Tuberculin test as a screening procedure had no place especially in developing countries with high infection rates. Case findings by sputum examination was quite satisfactory in situations where prevalence of disease was high and resources were limited. The x-ray did help to detect some cases likely to be missed by sputum examination but x-ray facilities were costly to provide and by itself, x-ray was considerably less reliable than sputum examination. The salient findings of the studies of this Centre on appraisal of the relative merits of radiology and bacteriology as diagnostic tools in case-finding evoked considerable interest both amongst the panelists as well as the audience.

There was a session on training of doctors in which Dr. Viswanathan from India participated along with others. The significant point made in the discussion was that distinction has to be made between basic education of a doctor and training. Whereas training may vary from time to time to suit the requirements of community programme for any disease, this need not interfere with the basic education of a doctor.

A short session was devoted to treatment with the second-line drugs and Dr. Deshmukh from Bombay represented India in this session.

Two short sessions were devoted to the role of voluntary organizations, their relation vis-a-vis Governmental programmes, fund rais-

ing etc. How realistic and effective is the concept of voluntary support of tuberculosis control programmes in developing countries was also discussed at length. Dr. Holm of the IUAT, Mr. O'Brien of Canada, Mr. Cariappa and Dr. Deshmukh from India and Dr. Yamaguchi from Japan and a few workers from Malaysia participated in this interesting discussion. The consensus was that the voluntary organizations have to step up their fund raising activities and to take more effective steps in health education and organizational aspects of domiciliary treatment particularly prevention of drug default.

In the closing session, Commonwealth Award of Honour from the Chest and Heart Association of Great Britain was presented to Mr. Cariappa, Secretary General, Tuberculosis Association of India, by Dr. Lloyd Rusby in a very pleasant function. A rich tribute was paid to Mr. Cariappa's services in the cause of tuberculosis in India and the support which he received from Mrs. Cariappa in the efficient discharge of his duties. Mr. and Mrs. Cariappa were the recipients of congratulations and tributes from all participants in the conference.

### **Tuberculosis set up in Singapore**

There are 3 clinics and one hospital in Singapore. The hospital is run by the Government and of the 3 clinics, 2 are managed by the Singapore anti-TB Association (SATA) and one by the Government. There is no demarcation of zones in which the clinics work and patients from any part of Singapore attend a clinic of their choice. However, all diagnosis and treatment is free for all patients in the Government clinic, but in the SATA clinics only 30% of the patients are totally free, another 30% pay from 1 to 5\$ per week; 30% pay full charges i.e. 6\$ per week and the remaining 10% are insured persons, from whom all treatment is included in the yearly premium of 10% per head. Only about 20% of the total patients in Singapore attend the SATA clinics.

All the clinics are very lavishly equipped and furnished (as compared to Indian standard). Although no authentic figures regarding prevalence and incidence of disease are available, it is obvious that the morbidity rate has fallen appreciably during the last 10 years. In the year 1967 the number of new cases discovered was 187 per 100,000 as against 358 per 100,000 in 1959. Accurate data about mortality rates is available and the rate at present is 28 per 100,000 (8th in the causes of death) whereas ten years ago,

it was 40. There is an elaborate scheme for economic assistance to poor TB patients. Every TB patient who is put off work gets financial assistance ranging from 45 to 120 \$ per month depending upon the number of dependants from the Government department of Social Welfare.

Case-finding by mass radiography is being carried out both by the Government clinic as well as the SATA clinics. However, the coverage of eligible persons examined being less than 50% usually, no estimate of prevalence can be based on these examinations. On the whole about 1% of the population covered is now being found to have active disease whereas this percentage was nearly 5 in 1959.

On the whole the impression one gained was that tuberculosis is rapidly being brought under control in Singapore primarily because of abundant resources.

### **Tuberculosis set up in Hong Kong**

For a population of 4 million in Hong Kong adjacent territory, 16 million Hong Kong \$ are being spent on tuberculosis every year and this constitutes 1/10th of the total budget for health services in the colony. Two hospitals with 250 and 600 beds are being maintained but most of the beds now are being used for treatment of non-pulmonary tuberculous conditions and non-tuberculous chest diseases. The cost of hospital treatment per patient per day is 23 \$. The indications for hospitalization are more or less as in Delhi.

Six clinics with 34 peripheral injection centres provide an efficient domiciliary service. The main clinics are open from 8 A.M. to 7.30

P.M. to provide supervised domiciliary treatment. Patients attend the clinic daily at any convenient time for treatment for the first 6 months and thereafter collect the drugs once a month for self administration. With this set up the default rate is extremely low (not more than 5%). Each main clinic has one Sister Incharge, one Health Visitor and 13 Auxiliary Health Visitors. The ratio of doctors works out at one per 40 patients.

No authentic data with regard to prevalence and incidence of disease are available. In 1967, 15 cases of meningitis were notified as against 300 in 1959. Morbidity at present is believed to be about 1%, 1/5th of the cases being bacillary. Ninety five percent of all new borns are covered by BCG vaccination. BCG vaccination is repeated, if necessary, after tuberculin testing when children enter the schools. One out of every 10 patients gets financial assistance from the Government during the period of treatment. This assistance amounted to 250,000 \$ last year.

The overall impression about the tuberculosis situation in Hong Kong is more or less the same as for Singapore. Ample resources with population concentrated in a small area is responsible for success in tuberculosis control programmes.

I am very grateful to the Chairman and members of the Managing Committee of the New Delhi Tuberculosis Centre, the Chairman, Secretary-General and the Executive Committee of the Tuberculosis Association of India for allowing me to attend the conference in Kuala Lumpur and visit- Singapore and Hong Kong thereafter.

## NEWS & NOTES

### 1969 TB Health Visitors Course

The Tuberculosis Health Visitors Course conducted by this Association has commenced in New Delhi on 3rd January, 1969. About 25 candidates from 8 States are undergoing this course.

### TB Week Celebrations

The Andhra Pradesh TB Association celebrated the 4th TB week from 2nd to 8th October through the Domiciliary TB Centres in the city of Hyderabad. Meetings were organised at D.T.C. Centres, Nampally, Dabeerpura, Sultan Bazar and Musheerabad. The Association also distributed clothes to regular TB patients who had taken 12 to 18 months treatment without break.

On the concluding day a panel discussion on Tuberculosis was arranged through All India Radio, Hyderabad. Dr. B. Ramachandran, Additional Director of Medical and Health Services, was the moderator. Dr. K. Somayya, Deputy Director of Medical and Health Services, Dr. D. Umapathy Rao, Officer-in-Charge, TB Demonstration and Training Centre and C. Sreenivasa Rao, Tutor in Epidemiology of TB Demonstration and Training Centre, participated in the discussions.

### Mobile Mass Miniature Radiography in Bombay

The second survey of Mobile MMR of Bharatiya Arogya Nidhi, Bombay worked out the percentages as ; Koch's positive 1.6% ; Suspicious Koch's 2.0% ; Old TB 1.9% ; Bronchitic changes 1.0% ; all other abnormalities 1.4% ; Total of chest abnormalities is 8.7%.

Besides TB, all Chest abnormalities seen in MMR, there are references to raised diaphragm (20), spinal deformity (37), and congenital defects of ribs (31). There were 8 cases of Dextrocardia forming one of Dextrocardia for every 3105 of persons X-rayed. There was a single case of calcified guineaworm for the whole series.

Dr. R.V.S. Rao who conducted the survey highlighted the fact that tuberculosis formed 63.4% (1372) of the total chest abnormalities of 2166 seen among 24844 X-rayed. Bronchitic changes came second with 11.0% (238) Cardiological factors came third with 9.1% (196) leaving 16.5% (360) for all other abnormalities.

Perhaps this is the first time when an analysis has been made of all chest abnormalities.

### Junior Award

The Association has selected Dr. R. Parthasarathy, Senior Medical Officer, Madanapalle TB Research Unit, Madanapalle Chittoor for the 1968 award for his article on "Unsupervised domiciliary chemotherapy for one year with simple oral drugs in the treatment of of Bacillary Tuberculosis in a community". The prize carries a cash award of Rs. 300/-.

### Proceedings of XXIII TB Conference

Copies of the Proceedings of the Twenty-third Conference held in Bombay in 1968 are available for sale from the Tuberculosis Association of India, 3 Red cross Road, New Delhi—1

# The Indian journal of Tuberculosis

## ABSTRACTS

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### **Comparison between high daily dosage of Isoniazid in divided doses and low daily dosage in a single dose in triple drug regimen.**

*Cooperative study unit on chemotherapy of tuberculosis of the National Sanatoria in Japan, Tuberc. Land. (1968), 49, 170.*

The patients with previously untreated pulmonary tuberculosis and positive cultures were allocated at random to two regimens. S.H.P.-Streptomycin 1 Gm twice weekly plus Isoniazid 300 mgm in a single dose daily (approximately 7 mgm/Kg body weight) plus P.A.S. 10 gm in three divided daily doses (152 patients) S.H.P.-Streptomycin 1 gm twice weekly plus Isoniazid 18 mgm/Kg body weight in three divided doses daily plus P.A.S. 10 gm in three divided doses (123 patients).

The rate of sputum conversion at 6 months was 97% in the ordinary dose regimen (S.H.P.) and 97% in the high dose regimen (S.H.P.). Thus the high dose Isoniazid regimen is not advantageous over the small, single daily dose regimen in the case of Japanese patients, most of whom are rapid inactivators of Isoniazid. The incidence of toxicity was almost the same with two regimens.

H. B. D.

### **Studies with the purified protein derivative of human and avian Tuberculosis in South Queensland.**

*E.W. Abrahams and R.D. Harland., Tuberc. Land, (1968) 49, 192*

Simultaneous intradermal injections of human and avian P.P.D. were given to 734 school children firstly by using (5 T.U. human and 4 T.U. avian) dose and then (100 T.U. human and 80 T.U. avian) dose on negative reactors of 4 m.m. or less diameter of induration. The results were analyzed according to whether the individual had not had a previous skin test or a B.C.G. vaccination (non B.C.G. group) or had a previous B.C.G. vaccination because of a negative Heaf test (B.C.G. group).

The non-B.C.G. children with no previous skin test as a group had much higher sensitivity rate to the avian P.P.D. than to human P.P.D. and the reactions were larger to the avian than, the human antigen.

The B.C.G. children also had a larger mean reaction size to the avian P.P.D. than the human P.P.D. but this was not so marked as in the non-B.C.G. children. This larger reaction to the avian antigen bore no relation to the time since B.C.G. vaccination, the pattern of the co-relation of reaction sizes remaining similar from five months since vaccination to several years afterwards.

In a second study, school children with an average of 13 years were skin tested with low dose P.P.D. human and P.P.D. avian by the intradermal (Mantoux) method prior to routine B.C.G. vaccination.

Corelation of reaction sizes three days after the tests gave a pattern indicating a high rate of sensitization amongst these children to avian P.P.D. and some cross sensitization to human P.P.D. The sensitizing agent is thought to be a Battey group III organism which is commonly isolated from human sources in Queensland and is widely distributed in nature. This also has a close antigenic relationship with the avian bacillus.

All children with a reaction size of 4 mm or less induration to the human P.P.D. were given B.C.G. vaccination, the size of reaction to avian P.P.D. being ignored.

Seven weeks after vaccinations retesting showed that reactions to both antigens were larger and more frequent, but that those to avian P.P.D. were larger than those to human P.P.D. It is suggested that effect of this particular B.C.G. vaccination in these children who have some experience of mycobacterial infection, possibly with a Battey group III organism had a greater sensitizing effect. The results may also be influenced by human P.P.D. not being the homologous antigen of B.C.G.

H. B. D.

**A comparison of the toxicity of prothionamide and ethionamide.**

*A . report from the research committee of the British Tuberculosis Association, Tuberc. Land, (1698), 47, 125.*

The study was planned to assess the tolerance of patients for and lower toxicity of 0.75 gm prothionamide daily compared with 0.75 gm ethionamide in the treatment of pulmonary tuberculosis.

The patients were also given 300 mgm Isoniazid and 0.75 gm/1 gm streptomycin daily. The duration of the treatment was 10 weeks.

Patients were assessed by sign and symptoms of lower toxicity by fortnightly estimation of serum bilirubin and transaminase. Fifty three patients received prothionamide and 48 ethionamide.

Anorexia, nousea or vomiting were reported in 17(32%) patients treated with prothionamide and in 24 (50%) patients treated with ethionamide.

The difference is not significant ( $P>0.10$ ). In 14 (26%) patients in the prothionamide group and in 15 (31%) patients in the ethionamide group, these symptoms were graded as slight, and in 3 (6%) patients treated with prothionamide and in 9 (19%) patients treated with ethionamide they were classified as severe.

These differences are not significant ( $0.10>P>0.05$ ). Two (4%) patients in the prothionamide group were withdrawn from treatment because of severe gastrointestinal intolerance. Elevation of serum transaminase was more commonly detected than a rise in serum bilirubin. Five (9%) patients of the prothionamide group and five (10%) patients in the ethionamide group had elevated transaminase or serum bilirubin levels in two consecutive estimations. Prothionamide is better tolerated than ethionamide though the difference, if it exists, is not great. It is equally liable to cause disturbance on liver function.

**H. B. D.**

**Isoniazid and Loss of Memory**

*Povl Zander Olsen & Kjeld Terning. Scand. J. Resp. Dis.; 1968, 49: 1, 1.*

It has been found that some patients under treatment with INH and PAS develop an impairment of memory which does not prevent

them from concentrating on important work but makes them forget things in the peripheral part of the attention sphere. To substantiate this problem, 38 selected patients were studied. All patients over 65 years of age, alcoholics and those with disturbed personality test were excluded from the study. A special memory test and the "subtle" test were performed on these patients before the start of treatment, during the course of treatment and finally some months after the chemotherapy had been discontinued. The tests showed a statistically significant impairment of memory at the examination during treatment as compared with the examination before and after treatment. The results at the 3rd examination i. e. after treatment had been discontinued showed no statistically significant difference from the pre-treatment tests.

**S. P. P.**

**Serum Transaminase Levels in Pulmonary Tuberculosis**

*P.A. Ockerman & C. Ryde. Scand. J. Resp. Dis.; 1968, 49: 1, 35.*

In a group of 135 patients with untreated pulmonary tuberculosis, the number of pathological transaminase values in the serum (22.2%) was significantly higher than in 78 controls (5.1%). During treatment with streptomycin, INH and PAS, the number of pathological transaminase values increased highly significantly as compared with the pre-treatment values. During treatment with streptomycin, INH and Isoxyl, the number of pathological values decreased significantly as compared with pre-treatment values, and the latter were significantly lower than in the case of streptomycin, INH and PAS combination.

In patients both treated and untreated, who had pathological transaminase values, the increase in GPT was higher than in GOT. Liver damage would subsequently be a plausible explanation for the pathological transaminase values. The authors conclude that streptomycin, INH and Isoxyl combination has little toxic effect on the liver whereas streptomycin, INH and PAS combination gives rise to toxic effects in many patients.

**S. P. P.**

**Antimycobacterial Activity of Guinea Pig Tissue Extracts**

*Hamid R. Razai. Scand. J. Resp. Dis.; 1968, 49:2,111.*

Antimycobacterial effects of normal and immunized (by BCG vaccination) guinea pig

tissue extracts were compared *in vitro* studies. Both normal and immune macrophages and liver, spleen and lung extracts possessed inhibitory activity against growth of *M. Tuberculosis*. The activity of the immune liver, spleen and lung extracts exceeded the activity of normal ones. It was demonstrated that lung extracts had more potent inhibitory activity than extracts of spleen, liver and macrophages. Antimycobacterial factor of guinea-pig lung extract showed that it is a heat labile, non-dialyzable acetone or alcohol-insoluble factor.

S. P. P.

#### **The effects of BCG vaccination in naturally infected tuberculin-positive individuals**

*T. Egsmose. Scand. J. Resp. Dis.; 1968,49:2,123.*

A controlled study of BCG vaccination amongst spontaneously tuberculin positive school children was carried out to demonstrate if there is any risk of activating pulmonary foci in such children, since pre-vaccination testing is advocated in view of such a hypothetical risk. The sputum of 20,555 tuberculin positive children, nearly half of which were randomly vaccinated and the other half left as controls, was examined 6 to 24 months after vaccination. Tubercle bacilli were excreted by 1.6% amongst the vaccinated and 1.4% in the control group, the difference being insignificant.

The authors conclude that among the children of school age, the BCG vaccination of tuberculin reactors has neither a deliterious nor a beneficiary effect on a pulmonary tuberculous focus.

S. P. P.

#### **Effect of repeated tuberculin tests on skin-reactions in BCG vaccinated guinea pigs**

*Tor Bajerkedal & Egil H. Lehmann. Scand. J. Resp. Dis.; 1968,49:1,42.*

Two groups of guinea pigs which had been vaccinated one year previously were given 2 intra-dermal tests with a 25 TU dose of PPD 14 days apart. One group had received a series of tuberculin tests after vaccination, the other was not tested for 40 weeks. The authors conclude that a tuberculin test has an accelerating effect on the reaction to subsequent tests and that this effect, which appears within 2 weeks, disappears within 40 weeks. The problem of how to compare sizes of different kinds of tuberculin reactions is raised but up to now a satisfactory solution has not been found.

S. P. P.

#### **Diffuse pulmonary fibrosis and blackfat tobacco smoking in Guyana**

*G. J. Miller. The Lancet: 1968, II, 259.*

A diffuse pulmonary fibrosis has been seen in Guyana. The disease is limited to East Indians and is mostly found in one locality where a particular variety of tobacco known as blackfat tobacco is smoked.

Common clinical features are weight loss, dyspnoea at rest, central cyanosis, scattered basal crepitations and signs of right ventricular hypertrophy. Most patients had dry cough. None complained of haemoptysis or wheezing. Clubbing was rare. Radiologically, diffuse fibrotic changes were seen, most prominently in mid zones of the lungs and occasionally micronodules with honey combing or patches of consolidation. In advanced cases, typical picture of cor pulmonale was seen.

In a survey of that area, not one case of fibrosis was encountered among the majority of the population who did not smoke blackfat tobacco thus suggesting casual relationship between fibrosis and blackfat tobacco smoking.

S. P. P.

#### **Pulmonary Oedema in Bacterial Shock**

*J.F. Riordan, G. Walters. The Lancet; 1968, 1,719*

Five necropsies are reported in which pulmonary oedema was apparently caused by non-pulmonary bacterial infection. Over-transfusion as a cause of pulmonary oedema in a patient who has received intra-venous fluids is sometimes the result of over-infusion, but not invariably so, particularly in patients without evidence of pre-existing heart disease. The role of infection must be assessed and careful consideration given to the possible need for further infusion. Pulmonary oedema does not necessarily contra-indicate further infusion.

S. P. P.

#### **Pulmonary Fungal Ball due to a Nocardia Species**

*P.V. Kurup, V.N. Sharma, R. Viswanthart, R.S. Sandhu, U.S. Randhawa, & V.N. Damadaran. Scand. J. Resp. Dis.; 1968, 49:1, 9.*

A case of fungal ball caused by a nocardia species is reported in an Indian housewife. The ball was found in a bronchiecatatic cavity in

**Ind. J. Tub., Vol. XVI, No. 1**

the right lung. It measured 1.4 x 1 cm and comprised of confluent granules each measuring 100-400\* in diameter. The granules consisted of gram-positive and partially acid-fast branching filaments and cocco-bacillary bodies which varied from 0.5-1.5  $\mu$  in width. Cultures yielded » gram-positive, partly acid-fast organism which was morphologically compatible with nocardia.

S.P. P.

#### Hypoxaemia in Bronchial Asthma

*K.N.V. Palmer, M.L. Diament. The Lancet; 1968, I, 318.*

Forty one patients in status asthmaticus had hypoxaemia without hypercapnia and severe obstructive and restrictive ventilatory impairment. Although the primary disability in bronchial asthma is increased airway obstruction, at an early stage of the attack there is little if any restrictive impairment and hypoxaemia is usually not present at this stage. The findings confirm that hypoxaemia is a common disturbance in severe bronchial asthma and it is not normally accompanied by hypercapnia.

The extent of hypoxaemia in these cases was closely related to the restrictive but not the obstructive ventilatory impairment. Reasons are given for regarding a decrease in lung compliance as result of hyperinflation as of greater

importance in the production of hypoxaemia in asthma than obstruction to bronchial air-flow.

S. P. P.

#### Relative Contributions of Obstructive and Restrictive Ventilatory Impairment in the production of Hypoxaemia and Hypercapnia

*K.N.V. Palmer, M. L. Diament. The Lancet; 1968, I, 1233*

Thirty seven patients with chronic bronchitis had severe obstructive and restrictive ventilatory impairment with hypoxaemia and hypercapnia. The findings suggest that in Asthmatic, hypoxaemia is associated mainly with reduced F.V.C. secondary to hyperinflation and the PaCO<sub>2</sub> level is normal or low, only rising with impending deterioration. In the bronchitic, on the other hand, although hypoxaemia is associated with a falling F.V.C., hypercapnia is the most important and concomitant finding. Hypercapnia is related to a restrictive and not to the obstructive ventilatory impairment but hypoxaemia was closely related to the degree of hypercapnia but not at all to the obstructive ventilatory impairment. Despite the fact that chronic bronchitis is thought of as obstructive lung disease, the changes in blood-gas tensions seem to be more closely related to the restrictive ventilatory impairment.

S.P. P.