A RADIOLOGICAL STUDY OF PULMONARY TUBERCULOSIS IN THE IN-PATIENTS OF THE BIR HOSPITAL KATHMANDU, NEPAL

by

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Preface

This work was done in the Bir Hospital of Kathmandu. The bed strength of this hospital which is a general hospital, is 320 since Dec. 15, 1968. Before this date its bed strength was 250. This work is the first radiological study of chests of the In-Patients of the Bir Hospital admitted from 13th April 1964 to 15th Dec. 1970. Only those patients who were sent for chest X-Ray examinations from different wards of this hospital were included in this study.

Method

Chest X-Rays were counted on the number of the In-Patients sent for X-Ray chest examinations. Thus each individual represented a number. Bronchographic examinations were done, when needed, to facilitate diagnosis. Histological examinations were done to confirm the diagnosis further in a few cases. The individuals were divided mainly under two groups, males and females, who were further subgrouped under the **age under 40 years** and **under the age 40 years or above** for comparative study of the pulmonary conditions of each group and subgroup.

Pulmonary tuberculosis was classified as follows:-

I. Suspected active TB:

- i. Far advanced, cavity type;
- ii. Not far advanced, cavity type;
- iii. Suspected cavity in unstable type;
- iv. Non-cavity unstable type,

2. Suspected inactive TB:
Non-cavity stable type.
3. Healed type
4. Hilar lymph node swelling
5. Exudative pleurisy.

Only 1st and 4th varieties are included in the series of Pulmonary tuberculosis in this study.

Result

From 13th April 1964 to 15th Dec. 1970, 60857 patients were admitted in the various wards of the Bir Hospital including its Infectious Disease Unit. Of these In-Patients, 27794 were males and 33063 were females. The number of individuals whose chests were X-Rayed was 7078, of which 2850 cases had normal chests, 1659 cases had pulmonary tuberculosis who needed treatment, 54 cases had bronchiectasis, 15 cases had bronchogenic carcinoma, 806 cases had pneumonia or pneumonitis, 498 cases had pleurisy and 1196 cases had other diseases like cor-pulmonale, chronic bronchitis, and etc. (Table I)

Yearly Admission In Percentage

GABPH No. 1

GARPH No. 2

Yearwise break up of the cases showed the following results:-

In the first year (13th April 1964—12 April 1965), 6188 patients were admitted; 350 patients (5.65 per cent) had their chests X-Ray done, of which males were 3.16 per cent and females were 2.48 per cent.

The following figures showed the number of individuals having had different chest conditions:-

- 135 cases (38.57 per cent) had normal chests
 - 83 cases (23.7 per cent) had pulmonary tuberculosis
 - 5 cases (1.42 per cent) had bronchiectasis
 - 34 cases (9.7 per cent) had pneumonia
 - 17 cases (4.85 per cent) had pleurisy
 - 76 cases (21.7 per cent) had other diseases
- (Table 2)

In the second year (13th April 1965—12th April 1966), 9188 patients were admitted. 852 patients (9.27 per cent) had their chests X-Ray done, of which males were 4.84 per cent and females were 4.42 per cent.

The following figures showed the number of individuals having had different chest conditions:-

- 317 cases (37.2 per cent) had normal chests;
 - 179 cases (21.0 per cent) had pulmonary tuberculosis;
 - 15 cases (1.76 per cent) had bronchiectasis;
 - 2 cases (0.23 per cent) had bronchogenic carcinoma;
 - 86 cases (10.09 per cent) had pneumonia;
 - 71 cases (8.33 per cent) had pleurisy;
 - 182 cases (21.3 per cent) had other diseases.
- (Table 2)

In the third year (13th April 1966—12th April 1967). 7616 patients were admitted; 675 patients (8.86 per cent) had their chests X-Ray done, of which males were 4.76 per cent and females were 4.09 per cent.

The following figures showed the number of individuals having had different chest conditions:-

- 309 cases (45.77 per cent) had normal chests;
 - 168 cases (24.88 per cent) had pulmonary tuberculosis;
 - 3 cases (0.44 per cent) had bronchiectasis;
 - 1 cases (0.14 per cent) had bronchogenic carcinoma;
 - 71 cases (10.5 per cent) had pneumonia;
 - 40 cases (5.92 per cent) had pleurisy;
 - 83 cases (12.29 per cent) had other diseases.
- (Table 2)

In the Fourth year (13th April 1967—12th April 1968), 8705 patients were admitted; 760 patients (8.7 per cent) had their chests X Ray done, of which males were 4.65 per cent and females were 4.0 per cent.

The following figures showed the number of individuals having had different chest conditions:-

251 cases (33.02 per cent) had normal chests;
212 cases (27.89 per cent) had pulmonary tuberculosis;
4 cases (0.52 per cent) had bronchiectasis;
102 cases (13.42 per cent) had pneumonia;
43 cases (5.62 per cent) had pleurisy;
148 cases (19.47 per cent) had other diseases. (Table 2)

In the Fifth year (13th April 1968—12th April 1969), 10083 patients were admitted, 1913 patients (18.97 per cent) had their chests X-Ray done, of which males were 11.6 per cent and females were 7.36 per cent.

The following figures showed the number of individuals having had different chest conditions:-

727 cases (38.0 per cent) had normal chests;
520 cases (27.18 per cent) had pulmonary tuberculosis;
7 cases (0.36 per cent) had bronchiectasis;
7 cases (0.36 per cent) had bronchogenic carcinoma;
201 cases (10.5 per cent) had pneumonia;
173 cases (9.04 per cent) had pleurisy;
278 cases (14.53 per cent) had other diseases; (Table 2)

In the Sixth year (13th April 1969—12th April 1970), 10785 patients were admitted; 1126 patients (10.44 per cent) had their chests X-Ray done, of which males were 5.36 per cent and females were 5.07 per cent.

The following figures showed the number of individuals having had different chest conditions:-

487 cases (43.25 per cent) had normal chests;
227 cases (20.15 per cent) had pulmonary tuberculosis;
3 cases (0.26 per cent) had bronchiectasis;
2 cases (0.17 per cent) had bronchogenic carcinoma;
152 cases (13.49 per cent) had pneumonia;
87 cases (7.72 per cent) had pleurisy;
168 cases (14.92 per cent) had other diseases. (Table 2)

In the Seventh year (13th April 1970—15th Dec. 1970), 8292 patients were admitted; 1402 patients (16.9 per cent) had their chests X-Ray done, of which males were 9.59 per cent and females were 7.3 per cent.

The following figures showed the number of individuals having had different chest conditions:-

Different Chest Diseases Shown in Percentage

GARPH No. 3

624 cases (44.5 per cent) had normal chests;
 270 cases (19.25 per cent) had pulmonary tuberculosis;
 17 cases (1.22 per cent) had bronchiectasis;
 3 cases (0.21 per cent) had bronchogenic carcinoma;
 160 cases (11.41 per cent) had pneumonia;
 67 cases (4.77 per cent) had pleurisy;
 261 cases (18.61 per cent) had other diseases. (Table 2)

The followings are the rates of incidence of pulmonary tuberculosis amongst different sexes under different age groups in the different years:-

In the first year

Total males (44 cases) - 53.01 per cent	Total females (39 cases) - 46.98 per cent.
Males under 40 years (27 cases)	Females under 40 years (24 cases)
- 32.53 per cent	- 28.51 per cent.
Males 40 years or above (17 cases)	Females 40 years or above (15 cases)
- 20.48 per cent	- 18.07 per cent

(Table 3)

In the Second year

Total males (92 cases) - 51.39 per cent	Total females (87 cases) - 48.6 per cent
Males under 40 years (71 cases)	Females under 40 years (54 cases)
- 39.66 per cent	- 30.16 per cent
Males 40 years or above (21 cases)	Females 40 years or above (33 cases)
- 11.73 per cent	- 18.42 per cent

(Table 3)

In the third year

Total males (95 cases) - 56.54 per cent	Total females (73 cases) - 43.44 per cent
Males under 40 years (62 cases)	Females under 40 years (53 cases)
- 36.9 per cent	- 31.54 per cent
Males 40 years or above (33 cases)	Females 40 years or above (20 cases)
- 19.64 per cent	- 11.9 per cent

(Table 3)

In the fourth year

Total males (118 cases) - 55.66 per cent	Total females (94 cases) - 44.33 per cent
Males under 40 years (78 cases)	Females under 40 years (65 cases)
- 36.79 per cent	- 30.56 per cent
Males 40 years or above (40 cases)	Females 40 years or above (29 cases)
- 18.86 per cent	- 13.67 per cent

(Table 3)

In the Fifth year

Total males (321 cases)-61.73 per cent	Total females (199 cases) - 38.26 per cent
Males under 40 years (181 cases)	Females under 40 years (147 cases)
- 34.8 per cent	- 28.26 per cent
Males 40 years or above (140 cases)	Females 40 Years or above (52 cases)
- 26.92 per cent	- 10.0 per cent

(Table 3)

In the sixth year

Total males (119 cases)-52.42 per cent	Total females (108 cases) - 47.57 per cent
Males under 40 years (66 cases)	Females under 40 years (64 cases)
- 29.07 per cent	- 28.19 per cent
Males 40 years or above (53 cases)	Females 40 years or above (44 cases)
- 23.34 per cent	- 19.38 per cent

(Table 3)

In the Seventh year

Total males (180 cases) - 66.66 per cent	Total females (90 cases) - 33.33 per cent
Males under 40 years (100 cases)	Females under 40 years (58 cases)
- 37.03 per cent	- 21.48 per cent
Males 40 years or above (80 cases)	Females 40 years or above (32 cases)
- 29.62 per cent	- 11.85 per cent

(Table 3)

(See Graphic figures 4 and 5 Overleaf)

To facilitate diagnosis of the cases 28 bronchographic examinations were done of which 12 were done for bronchiectasis, 7 were done for bronchogenic carcinoma 1 for pulmonary tuberculosis cavity, 2 for lung abscesses, 1 for benign lung lesion (Benign tumour), 2 for basal collapse, 2 for liver abscesses and 1 for pleural effusion (encysted). 6 cases of bronchiectasis were confused with pulmonary tuberculosis of which 5 cases were irregularly treated as pulmonary tuberculosis and 1 case was admitted as a case of pulmonary tuberculosis for two years in the local Tokha sanatorium.

The six cases confused with pulmonary tuberculosis had recurrent attacks of haemoptysis and they were as follows:-

1. R 16 years female
2. B 18 years male

Pulmonary Tuberculosis Index

M - Male

F - Female

GRAPH No. 4

Comparative Graph of Pulmonary Tuberculosis in Different Sexes

GRAPH No. 5

3. G 27 years female
4. S 40 years male
5. TK 31 years male
6. NB 35 years male. He was treated in the local sanatorium for 2 years as a case of pulmonary tuberculosis.

5 cases of bronchogenic carcinoma were confused with pulmonary tuberculosis.

1. Suba 46 years female.
She was treated for pulmonary tuberculosis at Darbhanga (India).
She was referred to us. Bronchography was done which showed bronchostenosis.
She died a month after.
2. Lax 46 years female was treated for pulmonary tuberculosis and effusion.
Bronchography showed bronchostenosis. Biopsy of a swelling of the right chest wall showed adenocarcinoma. The patient died 15 days later.
3. Nar 48 years female was treated for pulmonary tuberculosis in Lucknow although no investigations supported this diagnosis.
She was referred to us. Bronchography was done which showed bronchogenic carcinoma. The patient died in the evening.
4. Kr 40 years male was treated for pulmonary tuberculosis for nearly a year although diagnosed as a case of bronchogenic carcinoma. He went to Patna for radiotherapy when the disease had advanced. He died a month after.
5. Mrs. Shrestha 45 years female was treated as a case of pulmonary tuberculosis and effusion for nearly six months. Bronchography showed bronchostenosis. Biopsy of a rib showed adenomacarcinomatous deposits.

1 case of bronchogenic carcinoma was confused with encysted pleural effusion.

The male patient of 52 years used to have attacks of unconsciousness. His blood sugar was 35 mgper 100 c.c. during the attack. Bronchography showed an irregular bronchostenosis of the right lower lobe. Biopsy of his neck gland showed an oat-cell carcinoma.

1 case of pulmonary tuberculosis was confused with pneumonitis. This male patient of 28 years had his sputum examination negative on several occasions. Fever was persistent throughout his stay in the hospital. Bronchography showed a cavity. On anti-T.B. treatment fever subsided and he was referred to the Central Chest Clinic.

1 case of encysted pleural effusion was confused with bronchogenic carcinoma and was referred to Patna for radiotherapy but the patient came to us. Bronchography was done which showed pleural effusion. Subsequent anti-T.B. drugs resolved his pleural effusion.

Discussion

The report on tuberculosis survey in Bhaktapur, Kathmandu Valley, Nepal by the Japanese medical team, 9th Nov. 1965 to 28th Feb. 1966, showed 558 cases of suspected pulmonary tuberculosis (8.0 per cent) amongst 6954 persons X-Rayed. Rate of incidence of pulmonary tuberculosis was shown increased with the increase of age and reached 13.5 per cent in the age group between 31 and 50 years. According to sex the rate of suspected pulmonary tuberculosis was shown 7.6 per cent in male and 8.8 per cent in female.

The findings of suspected non-tuberculosis were shown as discovered on the chest X-Ray of 180 persons (2.6 per cent). The most was bronchiectasis 87 (1.3 per cent). The second was bronchitis 36 (0.5 per cent), pneumonia 33 (0.5 per cent). In none of the suspected bronchiectasis bronchography was done to confirm the diagnosis. Bronchiectasis and cardiac cases predominated in higher age groups. Pneumonia was dominant in younger ages. The report did not mention a single case of bronchogenic carcinoma possibly suggesting that the Japanese Medical Team did not come across a single case, or they missed it.

Our study was done in a general hospital. So naturally the rates of incidence of diseases were high. We have now the following few facts.

1. More females were admitted every year than males but more males were chest X-Rayed than the females.
2. There was no alarming rise of the incidence of diseases over the years.
3. Pulmonary Tuberculosis incidence was more in males than in females. Rate of incidence of Pulmonary Tuberculosis was more in the age group under 40 years in both sexes, more so in the males. But The Pulmonary Tuberculosis index showed rising curves amongst males whereas the curves were declining amongst females.
4. Rates of incidence of Bronchiectasis varied from 0.26 per cent to 1.76 per cent. Index curves of Bronchiectasis were shown gradually rising amongst males.
5. Rate of incidence of Bronchogenic carcinoma was nearly 1 in 500 inpatients who had their chests X-Ray done.
6. Rate of Pneumonia was more in males than in females. And this was more in the age group under 40 years in both sexes, more so in the males. Pneumonia index curve showed rising amongst males under 40 years of age.
7. Rate of incidence of Pleurisy was more in the males than in the females and this was more in the age group under 40 years in both sexes, more so in the males. Pleurisy Index Curves showed some rise amongst both sexes in the age group 40 years and above; more so amongst the males since the year 1969-1970.

Pulmonary Tuberculosis

GRAPH No. 6

Comparative Graph of Pulmonary Tuberculosis Index

GRAPH No. 7

Conclusion

A radiological study of the pulmonary conditions of 7078 in-patients (total admitted patients 60857 of the Bir Hospital) was done. More females were admitted than males but more males were sent for chest X-Rays than females. Incidences of diseases were high in males than in females. There was no alarming rise of the incidence of diseases over the years. There was no rise of the rate of incidence of Bronchogenic Carcinoma over the years.

Index Curves of Pulmonary Tuberculosis amongst males were rising, a point to note.

Bibliography

The report on tuberculosis survey in Bhaktapur, Kathmandu Valley, Nepal by the Japanese Medical Team, 9th Nov. 1965 to 28th Feb, 1966.

TABLE I

From 2021 to 2027 (13-4-64) to (15-12-70)	Males			Females			General total
	Under 40 years	40 years & above	total	Under 40 years	40 years & above	total	
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1. Normal	1107	423	1530	983	327	1320	2850
2. T.B. Lung	585	384	969	465	225	690	1659
3. Bronchiectasis	10	19	29	5	20	25	54
4. Primary							
Lung	1	7	8	1	6	7	15
Cancer							
5. Pneumonia	232	148	480	221	105	326	806
6. Pleurisy	214	103	317	122	59	181	498
7. Other Diseases	270	351	621	264	311	575	1196
Total		3954				3124	7078

TABLE 2
YEARLY ADMISSION
And In-Patients Chest X-Rayed

Year	Yearly Admission		In-Patients Chest X-Rayed		
	Males	Females	Males	Females	Total
2021 (13-4-1964) to (12-4-65)	2970 47.99 per cent	3218 52.0 per cent	196 3.16 per cent	154 2.48 per cent	350 5.65 per cent
2022 (13-4-65) to (12-4-66)	4022 43.77 per cent	5166 66.22 per cent	445 4.84 per cent	407 4.42 per cent	852 9.27 per cent
2023 (13-4-66) to (12-4-67)	3566 46.82 per cent	4050 53.17 per cent	363 4.76 per cent	312 4.09 per cent	675 8.86 per cent
2024 (13-4-67) to (12-4-68)	3978 45.69 per cent	4727 54.3 per cent	405 4.65 per cent	355 4.0 per cent	760 8.7 per cent
2025 (13-4-68) to (12-4-69)	4696 46.57 per cent	5387 53.42 per cent	1170 11.6 per cent	743 7.36 per cent	1913 18.96 per cent
2026 (13-4-69) to (12-4-70)	4846 44.93 per cent	5939 55.06 per cent	579 5.36 per cent	547 5.07 per cent	1126 10.44 per cent
2027 (13-4-70) to (15-12-70)	3716 44.81 per cent	4576 55.18 per cent	796 9.59 per cent	606 7.3 per cent	1402 16.9 per cent

TABLE 3
Pulmonary Conditions of the In-Patients
CHEST X-RAYED

Year	T.B. Lungs	Bronchiec- tasis	Primary lung cancer	Pneumonia	Pleurisy	Other Diseases	Normal
2021 (13-4-64)	83	5	0	34	17	76	135
to (12-4-65)	23.7 p.c.	1.42 p.c.	0 p.c.	9.7 p.c.	4.85 p.c.	21.7 p.c.	38.57 p.c.
2022 (13-4-65)	179	15	2	86	71	182	317
to (13-4-66)	21.0 p.c.	1.76 p.c.	0.23 p.c.	10.09 p.c.	8.33 p.c.	21.3 p.c.	37.2 p.c.
2023 (13-4-66)	168	3	1	71	40	83	309
to (12-4-67)	24.88 p.c.	0.44 p.c.	0.14 p.c.	10.5 p.c.	5.92 p.c.	12.29 p.c.	45.77 p.c.
2024 (13-4-67)	212	4	0	102	43	148	251
to (12-4-68)	27.89 p.c.	0.52 p.c.	0 p.c.	13.42 p.c.	5.65 p.c.	19.47 p.c.	33.02 p.c.
2025 (13-4-68)	520	7	7	201	173	278	727
to (12-4-69)	27.18 p.c.	0.36 p.c.	0.36 p.c.	10.5 p.c.	9.04 p.c.	14.53 p.c.	38.0 p.c.
2026 (13-4-69)	227	3	2	152	87	168	487
to (12-4-70)	20.15 p.c.	0.26 p.c.	0.17 p.c.	13.49 p.c.	7.72 p.c.	14.92 p.c.	43.25 p.c.
2027 (13-4-70)	270	17	3	160	67	261	624
to (15-12-70)	19.25 p.c.	1.21 p.c.	0.21 p.c.	11.41 p.c.	4.77 p.c.	18.61 p.c.	44.5 p.c.

TABLE 5
T.B. LUNGS INDEX

Year	Males			Females		
	Under 40 years	40 years & above	Total	Under 40 years	40 years & above	Total
2021 (13-4-64) to (12-4-65)	100 p.c.	100 p.c.	100 p.c.	100 p.c.	100 p.c.	100 p.c.
2022 (13-4-65) to (12-4-66)	121.91 p.c.	57.26 p.c.	96.93 p.c.	104.30 p.c.	101.93 p.c.	103.44 p.c.
2023 (13-4-66) to (12-4-67)	113.42 p.c.	95.89 p.c.	106.63 p.c.	109.09 p.c.	65.84 p.c.	92.44 p.c.
2024 (13-4-67) to (12-4-68)	113.08 p.c.	92.08 p.c.	104.97 p.c.	106.04 p.c.	75.64 p.c.	94.34 p.c.
2025 (13-4-68) to (12-4-69)	106.95 p.c.	131.42 p.c.	116.43 p.c.	97.74 p.c.	55.33 p.c.	81.43 p.c.
2026 (13-4-69) to (12-4-70)	89.35 p.c.	113.94 p.c.	98.87 p.c.	97.49 p.c.	107.22 p.c.	101.25 p.c.
2027 (13-4-70) to (15-12-70)	113.81 p.c.	114.61 p.c.	125.74 p.c.	74.28 p.c.	65.56 p.c.	70.94 p.c.

TABLE 4
T.B. LUNGS

Year	Males			Females		
	Under 40 Years	40 Years & above	Total	Under 40 Years	40 Years & above	Total
2021 (13-4-64) to (12-4-65)	27 32.53 p.c.	17 20.48 p.c.	44 53.01 p.c.	24 28.91 p.c.	15 18.07 p.c.	39 46.98 p.c.
2022 (13-4-65) to (12-4-66)	71 39.66 p.c.	21 11.73 p.c.	92 51.39 p.c.	54 30.16 p.c.	33 18.42 p.c.	87 48.6 p.c.
2023 (13-4-66) to (12-4-67)	62 36.9 p.c.	33 19.64 p.c.	95 56.54 p.c.	53 31.54 p.c.	20 11.9 p.c.	73 43.44 p.c.
2024 (13-4-67) to (12-4-68)	78 36.79 p.c.	40 18.86 p.c.	118 55.66 p.c.	65 30.66 p.c.	29 13.67 p.c.	94 44.33 p.c.
2025 (13-4-68) to (12-4-69)	181 34.8 p.c.	140 26.92 p.c.	321 61.73 p.c.	147 28.26 p.c.	52 10.0 p.c.	199 38.26 p.c.
2026 (13-4-69) to (12-4-70)	66 29.07 p.c.	53 23.34 p.c.	119 52.42 p.c.	64 28.19 p.c.	44 19.38 p.c.	108 47.57 p.c.
2027 (13-4-70) to (15-12-70)	100 37.03 p.c.	80 29.62 p.c.	180 66.66 p.c.	58 21.48 p.c.	32 11.85 p.c.	90 33.33 p.c.

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We remember those souls, victims of Bronchogenic Carcinoma, who are no more now, who surrendered to us for Bronchographic Examinations.

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