**Magnoscopic Investigation (5th Report) : The Magnoscopically¹⁾
Detected Slight Difference of Intensity of Breathing
between Two Sides of Chest and the
Radiographic Findings.**

By

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Our daily experience has shown that most of healthy children, even at so grown an age as 11 or 12 years, show no difference of the intensity of breathing between either side of the breast even through the magnoscope. In other words, the breathing heard at the base of the right lung is not weaker than that heard at the base of the left lung in most of healthy children. This is what will be found not only through the ordinary stethoscope, but also through the magnoscope. As has already been described in preceding papers, the magnoscope will detect "micro râles" which can never be heard through the ordinary stethoscope. It will reveal "latent bronchial breathing" or "latent bronchophonia", which will otherwise remain utterly unnoticed.

Of all the juvenile cases with various complaints who visited our Pediatric Dispensary during 1935~1936 we have collected in the present paper those as with a slight difference of the intensity of breathing between both sides of the chest. And we have made a study of the X-ray picture of these cases.

Method of Investigation.

1. Materials. The children of the ages up to 12 years with the breast finding described above. The difference of the intensity of breathing was so slight that the ordinary biauricular stethoscope was

1) A. Sato and H. Nukiyama, Tohoku J. Exp. Med., 1940, 38, 45.

2) S. Miyachi, Nihon Hoshasen Igakkai Zasshi. 1936, 4, 347

TABLE

Cases, in which radiographic findings were found on the

No. of case	Name & Age m = months y = years	Complaints	State of nutrition	Clinical diagnosis	Tuberculin reaction and micro hemosedimentation
1	H. W. 6y 1m	Headache	Poor	Latent tuberculosis	(++) 9
2	T. H. 10y 2m	Healthy	Slightly poor	Latent tuberculosis	6
3	K. M. 1y 8m	Remittent fever and cough	Moderately poor	Tuberculosis of lung	(+) 13
4	H. S. 5y	Healthy	Slightly poor	Bronchitis acuta	(++) 7.5
5	K. K. 11y 2m	Fever, night sweat and exhaustion	Not described	Latent tuberculosis	17
6	B. K. 9y 1m	Fever and cough	Slightly poor	Influenza; Latent tuberculosis	6
7	T. S. 14y 11m	Night sweat	Good	Exacerbation of latent tuberculosis	14
8	T. S. 7y 5m	Headache and pleurodynia	Slightly poor	Pleuritis dex?	3
9	T. K. 1y 11m	Infundibular thorax	Moderate	Infundibular thorax; lat. tuberculosis	3
10	M. S. 4y 8m	Anorexia	Slightly poor	Latent tuberculosis	3.5
11	C. T. 13y	Cough	Good	Tuberculosis of lung	(+) 4
12	T. T. 11y	Healthy	Not described	Old pleuritis dex	6
13	K. S. 1y 5m	Occasional fever	Moderate	Broncho-pneumonia	
14	T. O. 4y 1m	Night sweat	Moderate	Tuberculosis of hilus	(-) twice
15	Y. S. 6y 1m	Anorexia, exhaustion and emaciation	Moderately poor	Malnutrition	(-) twice
16	M. C. 2y 10m	Dyspnoea	Poor	Congenital cardiac defect	
17	T. H. 11y 11m	Abdominal pain	Not described	Gastritis acuta; tuberculosis of hilus	-
18	T. H. 7y 1m	Healthy	Poor	Latent tuberculosis?	(±) 7.5
19	Y. S. 5y 11m	Otorrhoea	Slightly poor	Latent tuberculosis	(+)
20	S. S. 5y 7m	Limping	Not described	Tuberculous coxitis	
21	F. O. 7y 1m	Abdominal pain and diarrhoea	Slightly poor	Peritoneal tuberculosis	27
22	M. A. 6y 1m	Fever	Not described	Latent tuberculosis	20

1.

side of magnoscopically diminished breathing.

Blood picture	Breath sound slightly diminished on	Radiographic findings r = right l = left
	Right front	Infiltration from r. hilus to r. apical region
	Left back	Calcified primary focus on l. middle area
Examined	Left	Primary infiltration on l. lung with disseminated tubercles on both lungs (cf. Fig. 1)
	Right	Calcified primary complex and pleuritis mediastinalis superior on r. lung
Examined	Right back, lower	Infiltration from the hilus to the apex of r. lung
Examined	Right	Enlarged lymph node of r. hilus
	Right	Old pleuritis constodiaphragmatica dextra; round shadow with sharp border in r. infraclavicular field (cf. Fig. 2)
	Right	Enlargement of r. tracheobronchial lymph node and increased density of bilateral hilus shadow (cf. Fig. 3)
Examined	Right	Faint hazy shadow involves upper two thirds of r. lung
	Right back	Increased density of r. hilus; Suspicion of pleuritis mediastinalis interlobalis dextra
Examined	Right upper	Faint hazy shadow involves upper two thirds of r. lung; suspicion of r. pleuritis costodiaphragmatica (cf. Fig. 4)
	Right back, lower	Infiltration in r. lower area of lung; suspicion of pleuritis costalis dextra
	Left back	Infiltration in lower area of l. lung
Examined	Right back, lower	Increased trunk shadow and enlarged lymph node of r. hilus (cf. Fig. 5)
	Right	Increased hilus shadow and pleural induration of r. lung
	Right	Paravertebral infiltration of r. lung
	Right back middle	Formation of induration of r. pleuritis diaphragmatica
	Right	Increased shadow of r. hilus
	Left	Infiltration of l. lung from hilus upward
	Right	Enlargement of paravertebral lymph node and old pleuritis costalis of r. lung (cf. Fig. 6)
Examined	Right	Primary complex of r. lung
	Right back	Pleuritis mediastinalis dextra; exploratory puncture with exsudate (+)

Table 1. Continued.

No. of case	Name & Age m=months y=years	Complaints	State of nutrition	Clinical diagnosis	Tuberculin reaction and microhemosedimentation
23	U. S. 5y 11m	Healthy	Not described	Old pleurisy	(-) 16
24	M. O. 4y 11m	R. pleurodynia and cough	Slightly poor	Pharyngitis; pulmonary tuberculosis	9
25	S. H. 10y 5m	Enlargement of lymph nodes	Good	Chronic lymphadenitis	
26	T. H. 5y 1m	Fever	Moderately poor	Latent tuberculosis	(+) 7
27	Y. S. 4y 3m	Anorexia	Good	Convalescent from autopoisoning	14
28	F. H. 5y 10m	Pleurodynia	Moderately poor	Tuberculoxemia	25
29	A. T. 4y 9m	Night sweat	Moderately poor	Malnutrition; latent tuberculosis?	10
30	K. A. 4y 9m	Emaciation and anorexia	Poor	Latent tuberculosis	
31	H. T. 5y 1m	Emaciation, cough and fever	Slightly poor	Latent tuberculosis	(+)
32	K. Y. 3y 10m	Cough and sputum	Poor	Pulmonary tuberculosis	(-)
33	T. S. 3y 3m	Fever	Poor	Latent tuberculosis	(+)
34	K. N. 4y	Cough and sputum	Moderate	Latent tuberculosis	
35	T. T. 7y 6m	Cough	Moderately poor	Bronchitis chr.	
36	N. A. 5y	Cough	Moderately poor	Bronchitis acuta, lat. tuberculosis?	
37	A. S. 8y 6m	Night sweat	Slightly poor	Latent tuberculosis	4
38	T. K. 5y 4m	Fever	Moderate	Lymphadenitis colli; latent tuberculosis	(-)
39	S. A. 8y 5m	Night sweat and anorexia	Slightly poor	Tuberculosis of hilar lymph node	(+) 10.5
40	M. S. 7y 1m	Pallor and abdominal pain	Slightly poor	Anemia; latent tuberculosis	8.5

utterly or almost unable to detect it. Of course we excluded any case with râles or "micro râles" or such striking abnormalities with bronchial breathing. Cases with abnormality on percussion were also excluded.

2. Radiographic examination. There was a large number of cases with such a finding, but the cases that will be reported here were

Blood picture	Breath sound slightly diminished on	Radiographic findings r = right l = left
Examined	Right back	Old pleuritis costalis of r. lung
Examined	Right	Increased perihilar shadow of r. lung (cf. Fig. 7)
Examined	Right	Increased hilar shadow of r. lung (cf. Fig. 11 and 12)
Examined	Right	Increased hilar shadow of r. lung
Examined	Right	Increased trunk shadow of r. lung
	Right	Increased hilar shadow of r. lung
	Left back	Paravertebral infiltration of l. lung; r. hilar shadow slightly increased
	Right	Mantle and interlobar pleurisy of r. lung
	Right	Increased trunk shadow; swelling of hilar lymph node of r. lung
	Right back	Increased r. hilar shadow
	Right back	Swelling of r. hilar lymph node; increased hilar shadow of both lungs
Examined	Right back	Primary complex of r. lung
	Right	Increased r. hilar shadow toward lower field
Examined	Right	Increased r. hilar shadow
	Right back	R. hilar shadow slightly increased
	Right back	Calcified primary focus on r. supradiaphragmatic field
	Right	Calcified primary complex on r. lung
	Right front	Increased lower hilar shadow of r. lung

only those that were also radiographically examined; because for economic reason it was not all the cases with such an auscultatory phenomenon that were radiographically examined. Besides, and again for economical reason, most of the cases were radiographed only in an ordinary way, though it was our aim to make a tomograph in each case.

TABLE
Cases with a radiographic

No. of case	Name & age y = years m = months	Complaints	State of nutrition	Clinical diagnosis	Tuberculin reaction and microhemosedimentation
1	Y. M. 6y 8m	Fever, anorexia and exhaustion	Poor	Anemia, malnutrition and lymphadenitis colli	28
2	H. M. 7y 8m	Fever	Moderately poor	Tuberculosis of lung and abdomen	10
3	K. K. 4y 6m	Fever	Moderately poor	Lymphadenitis colli	26
4	Y. N. 7y 9m	Night sweat	Not described	Tuberculosis of hilus	2
5	T. K. 6y 6m	Exhaustion	Slightly poor	Influenza; latent tuberculosis	
6	Y. K. 4y 7m	Cough	Moderate	Pertussis? latent tuberculosis	6
7	T. K. 7y 3m	Emaciation	Moderately poor	Malnutrition; latent tuberculosis	2
8	Y. M. 6y 8m	Fever	Not described	Latent tuberculosis	7.5
9	M. T. 4y 9m	Photophobia	Moderately poor	Malnutrition and phlyctenular conjunctivitis	9
10	Y. T. 7y 8m	Headache	Poor	Malnutrition and pulmonary tuberculosis	(—)
11	N. S. 10y 8m	Anorexia and emaciation	Slightly poor	Latent tuberculosis	4
12	M. S. 11y 3m	Headache and exhaustion	Moderate	Latent tuberculosis	5
13	S. K. 3y 10m	Healthy	Moderately poor	Latent tuberculosis	2.5
14	S. U. 4y 3m	Healthy	Moderately poor	Peritonitis tuberculosis?	5
15	T. N. 12y 4m	Exhaustion and emaciation	Good	Latent tuberculosis	(+)
16	S. I. 8y 10m	Anorexia	Slightly poor	Latent tuberculosis?	
17	T. E. 11y 4m	Healthy	Not described	Healthy	
18	M. N. 7y 7m	Abdominal pain	Poor	Latent tuberculosis?	
19	N. S. 9y 7m	Exhaustion and emaciation	Slightly poor	Latent tuberculosis?	5.5
20	S. S. 11y 2m	Anorexia	Good	Latent tuberculosis?	
21	S. I. 7y 9m	Feebleness	Poor	Latent tuberculosis	3
22	K. S. 6y 5m	Emaciation	Very poor	Malnutrition and pulmonary tuberculosis	(#) 5.5
23	S. M. 8y 11m	Healthy	Moderate	Latent tuberculosis?	

2.

change on both sides of chest.

Blood picture	Breath sound slightly diminished on	Radiographic findings r = right l = left
Examined	Right back	Increased hilar shadow of both lungs; enlarged lymph node of r. hilus
	Right	Enlarged hilar lymph nodes of both lungs
	Right	Increased trunk shadow of both lungs
	Right	Enlarged hilar lymph nodes of both lungs
	Right	Enlarged hilar lymph nodes of both lungs
	Right	Increased trunk shadow of upper lobe of r. lung; enlarged lymph node of r. hilus
	Right back	Increased trunk shadow of both lungs
	Right	Increased hilus shadow of both lungs
Examined	Right	Increased trunk shadow of both lungs; enlarged r. hilar lymph node
Examined	Right	Increased trunk shadow of both lungs
	Right	Enlarged hilar lymph nodes of both lungs
Examined	Left	Increased trunk shadow of both lungs
	Right	Increased r. hilar shadow toward lower lobe; primary focus in l. upper lobe
	Right back	Increased trunk shadow of both lungs
Examined	Right	Increased hilar shadow of both lungs
	Right back	Enlarged hilar lymph nodes of both lungs
	Right back	Increased hilar shadow of both lungs
	Right back	Increased hilar shadow of both lungs
	Right back	Enlargement of r. bronchopulmonary lymph node; calcified l. hilar lymph node (cf. Fig. 8)
	Right back	Calcified hilar lymph nodes and increased trunk shadow of both lungs
Examined	Right	Enlarged hilar lymph nodes of both lungs
Examined	Right front	Primary complex of r. lung; increased shadow of l. lung
Examined	Right back, lower	Many calcified lymph nodes on the hilar region of both lungs (cf. Figs. 13 and 14)

TABLE
Cases with radiographic findings

No. of case	Name & age y = years m = months	Complaints	State of nutrition	Clinical diagnosis	Tuberculin reaction and micro hemosedimentation
1	T. T. 10y	Fever	Slightly poor	Latent tuberculosis	3
2	K. O. 10y 1m	Cough fever and emaciation	Slightly poor	Latent tuberculosis?	
3	Y. H. 10y 4m	Healthy	Not described	Healthy	19
4	Y. A. 4y 11m	Abdominal pain	Poor	Tuberculosis of hilar lymph node	

We were able to present a tomograph only in a few cases.

In general, the judgment of roentgenogramms in pathological cases is not easy, especially in young children. Shadows of the hilar parts of the left lung are difficult for identification especially due to the physiological middle shadows. An enlargement of endothoracal glands is also difficult particularly unless they are not calcified. Tomographs were very helpful especially in cases of glandular enlargement. We are heartily grateful to assistant Prof. Koga and Dr. Miyachi²⁾ of the Röntgen Department of our Hospital.

Result of Investigation.

If we summarize our result, then it will be like the following (Cf. Tables 1, 2, 3 and 4).

1. Our cases were 83 in number; the cases with the weaker breathing on the right chest were 77 and those with the weaker breathing on the left side only 6 (Cf. Table 5).

2. The cases with almost negative radiographic findings were only 16 in number (19% of all the cases).

3. The cases with positive radiographic findings were grouped in 6 groups. Group 1 with glandular enlargement or with primary complex, or hilar or tracheo-bronchial glandular enlargement; Group 2 with increased hilar shadow; Group 3 with increased lung trunk shadow; Group 4 with infiltration; Group 5 with old pleuritis mediastinalis, diaphragmatica or costodiaphragmatic and Group 6 with

3.

on the other side of diminished breathing.

Blood picture	Breath sound slightly diminished on	Radiographic findings r = right l = left
	Right	Enlarged calcified primary complex on l. lung (cf. Fig. 9)
Examined	Right	Enlarged l. hilar lymph node
Examined	Right	Enlarged l. hilar lymph node (cf. Fig. 10)
	Right	Increased trunk shadow of two thirds of l. lung

diffuse faint hazy lung shadow. Of course some cases presented combinations of these radiographic findings, but they were grouped according to their main feature. 23 cases belonged to Group 1, 16 cases to Group 2, 11 cases to Group 3, 8 cases to Group 4, 7 cases to Group 5 and 2 cases to Group 6 (Cf. Table 6).

4. In 40 cases (60% of all the cases), radiographic abnormality was found on the side of diminished breathing. In 23 cases (34%) the abnormality was found on both sides of the chest, and in 4 cases (6%) on the side of the stronger breathing (Cf. Table 6).

5. In the cases of old pleurisy, with infiltration, or with diffuse faint hazy lung shadow, the breathing was always diminished on the side with these radiographic findings, even though these were not very remarkable. Cases with radiographic abnormalities on the side with the stronger breathing were mostly those with glandular enlargement (Cf. Table 6).

6. As stated above, there were only 6 cases with diminished breathing on the left side. In 5 of these 6 cases, the radiographic abnormality was found on the side with diminished breathing or on the left.

7. Had tomographs instead of usual roentgenograms been taken, the result might have been more instructive. But a few tomographs taken in some cases did not show anything contrary to the usual radiographic findings, but rather confirmed the result still more (Cf. Figs. 11, 12, 13 and 14).

TABLE
Cases with no or almost no

No. of case	Name & age y = years m = months	Complaints	State of nutrition	Clinical diagnosis	Tuberculin reaction and micro hemosedimentation
1	C. K. 8y 8m	Fever and emaciation	Moderate	Abdominal tuberculosis?	1.0
2	K. H. 10y 2m	Night sweat	Slightly poor	Healthy	
3	K. S. 9y 4m	Feebleness	Not described	Pulmonary tuberculosis?	4
4	T. S. 10y 3m	Exhaustion	Not described	Spondylitis tuberculosa	
5	K. K. 9y 10m	Abdominal pain and anorexia	Not described	Spondylitis and peritonitis tuberculosa	
6	S. S. 10y 10m	Healthy	Poor	Malnutrition and latent tuberculosis?	3
7	S. S. 7y 2m	Fever	Moderately poor	Latent tuberculosis	18
8	T. M. 7y 7m	Fever and exhaustion	Slightly poor	Latent tuberculosis	
9	T. S. 11y 8m	Emaciation and fatigue	Not described	Latent tuberculosis	(-)
10	C. S. 6y 10m	Fever	Not described	Latent tuberculosis? Lymphadenitis colli	
11	S. S. 10y 3m	Fever	Poor	Abdominal tuberculosis?	(++)
12	E. T. 7y 8m	Headache and night sweat	Moderate	Latent tuberculosis	
13	M. S. 10y 10m	Fever and exhaustion	Not described	Latent tuberculosis?	
14	A. S. 6y 3m	Fever	Poor	Latent tuberculosis?	(±)
15	K. K. 5y 7m	Emaciation	Poor	Latent tuberculosis	5
16	M. A. 5y 6m	Cough	Not described	Tracheobronchitis; old pelurisy	

4.

radiographic abnormality.

Blood picture	Breath sound slightly diminished on	Radiographic findings r=right l=left
	Right back	No finding
	Right back	Almost no finding, or r. hilar shadow only slightly increased
Examined	Right back	Almost no finding
	Right back	Almost no finding
	Right	Almost no finding
	Right	Almost no finding, or calcified r. hilar lymph node
Examined	Right back	Almost no finding
	Right	Almost no finding
	Right back, lower	Almost no finding
	Right	Almost no finding, or r. hilar shadow only slightly increased
	Right	Almost no finding, or r. hilar shadow only slightly increased toward lower
	Right front	Almost no finding, or hilar shadow slightly increased in r. lower field
	Right back	No finding
Examined	Right back	Almost no finding, or suspicion of primary complex on r. lung
	Right back	Almost no finding
	Right	Almost no finding or r. hilar shadow only slightly increased

TABLE 5.
Percentage of cases with radiographic changes.

Radiographic findings	Breathing is diminished magnoscopically on			
	right side		left side	
	Cases	%	Cases	%
Cases with changes on the side of diminished breathing	35	45.5	5	83
Cases with changes on both sides of chest	22	28.5	1	17
Cases with changes on the other side of diminished breathing	4	5.2		
Cases with no or almost no changes	16	20.8		
Total	77		6	

TABLE
Summarizing

Radiographic findings	Cases with radiographic findings on the side of magnoscopically diminished breathing			
	++	+	±	Total
Enlarged lymph nodes { Primary complex hilar tracheobronchial	5	3	2	10
Increased hilar shadow	4	4	1	9
Increased trunk shadow of lung	1	2	1	4
Infiltration	7	1		8
Pleuritis { mediastinal diaphragmatic costodiaphragmatic	6	1		7
Faint hazy shadow of lung	2			2
Total	25	11	4	40 (60%)

Conclusions.

Children with complaints not limited to those of the respiratory tractus, with a slight difference of breathing on different sides only detected by means of the magnoscope showed in most cases an abnormality or abnormalities in the thorax radiographically,—tomographically in a few cases. And the abnormality was mostly found on the side of diminished breathing.

It is our daily experience to find in patients with no physical lung symptoms positive radiographic findings against our expectation, but if we use a magnoscope, we will be able to presume positive radiographic finding in children with magnoscopically diminished breathing on one side of the chest.

6.

table.

Cases with some radiographic findings on both sides of chest				Cases with radiographic findings on the other side of the diminished breathing			Number of cases with positive findings	Number of cases with no findings
++	+	±	Total	++	±	Total		
3	6	1	10	2	1	3	23	16
	4	3	7				16	
	6		6	1		1	11	
							8	
							7	
							2	(19%)
3	16	4	23 (34%)	3	1	4 (6%)	67 (81%)

Fig. 1. K.M. 1y. 8m.

Primary infiltration on l. lung
with disseminated tubercles
of both lungs.

Fig. 2. T.S. 14y 11m.

Old pleuritis costodiaphragmatica
dextra; round shadow with sharp
border in r. infraclavicular field.

Fig. 3. T.S. 7y 5m.

Enlargement of r. tracheo-
bronchial lymph node.

Fig. 4. C.T. 13y.

Faint hazy shadow of r. lung;
suspicion of r. pleuritis
costodiaphragmatica.

Fig. 5. T.O. 4y. 1m.

Increased shadow and enlarged lymph node of r. lung.

Fig. 6. S.S. 5y. 7m.

Enlarged paratracheal lymph node and old pleuritis costalis of r. lung.

Fig. 7. M.O. 4y. 11m.

Increased f. hilar shadow.

Fig. 8. N.S. 9y. 7m.

Enlarged r. bronchopulmonary lymph node; l. hilar calcified lymph node.

Fig. 9. T.T. 10y.
Calcified primary complex
of l. lung.

Fig. 10. Y.H. 10y. 4m.
Enlarged l. hilar
lymph node.

Fig. 11. S.H. 10y. 5m.
Increased r. hilar
shadow.

Fig. 12.
Tomograph of the same case
(Cf. Fig. 11).

Fig. 13. S.U. 8y. 11m.
Many calcified lymph nodes
of both hili.

Fig. 14.
Tomograph of the same case
(Cf. Fig. 13).