

D'ESPINE'S SIGN IN CHILDHOOD *

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This study was undertaken because of the difference of opinion which prevails as to what constitutes D'Espine's sign, and because of my impressions that D'Espine's sign is much less often present in the children of the well-to-do than in those of the hospital class, and that, when present in children of this class, it is in a considerable proportion of the cases not a manifestation of tuberculous infection. Six hundred and sixty-six patients, seen in my consultation and office practice during the last three years, form the basis of this study. These children were consecutive, except when for some reason they were unable, or unwilling, to talk, or when, through some oversight, a test was either not made or no record kept of it. The sign was tried for simply as part of the routine physical examination, and at the time the tests were made I had no intention of using the results for any purpose. The conclusions derived from these results, therefore, should be entirely unbiased.

Professor Adolphe D'Espine of Geneva in an article on "The Early Diagnosis of Tuberculosis of the Bronchial Glands in Children,"¹ said that he had called attention briefly to this method of diagnosis in 1889, in the fourth edition of the "Manual of Picot and D'Espine," and that Professor Brouardel, in a communication made for him at the session of the Academy of November 8, 1904, said: "The first signs of bronchial adenopathy are furnished exclusively by the *auscultation of the voice*, and are found almost always in the immediate neighborhood of the vertebral column between the seventh cervical vertebra and the first dorsal vertebra, sometimes in the fossa "sus-épineuse," sometimes in the interscapular space. They consist in a quality (timbre) added to the voice, which may be called *whispering (chuchotement)* in the first stage and *bronchophony* in a more advanced stage." He then goes on to say that "it is most important to distinguish the exaggerated normal voice sound from the bronchial voice sound. He says that "the tracheal sound is heard normally through the seventh cervical

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1. D'Espine: Bull. de l'Acad. de méd., Paris, 1907, Series 3, lvii, 167; British Med. Jour., 1910, ii, 1136.

spine, where it ceases abruptly. In bronchial adenopathy the bronchial sound extends downward into the space between the seventh cervical and the fourth or fifth dorsal spines. This space corresponds to the last portion of the trachea and the bifurcation of the bronchi, which is at the level of the third dorsal vertebra." He recommends the use of 333, in French, for making the test, and says, "if auscultation of the loud voice or cry gives no result, the child should be made to speak in a low voice." A sound is then heard which he designates as "whispering (*chuchotement*)." "This sound has the same value as bronchophony."

TABLE 1.—SHOWING PRESENCE OR ABSENCE OF D'ESPINE'S SIGN AT VARIOUS AGES

Age, Years	Present	Absent	Total	Per Cent.
1- 2	1	63	64	1.6
2- 3	1	79	80	1.3
3- 4	1	59	60	1.7
4- 5	1	83	84	1.2
5- 6	5	91	96	5.2
6- 7	5	68	73	6.8
7- 8	9	70	79	11.4
8- 9	9	42	51	17.6
9-10	3	20	23	13.0
10-11	4	33	37	10.8
11-12	1	18	19	5.3
	40	626	666	6.0

In a later communication in the *British Medical Journal* of 1910, he says that "the sign is most obvious when the child is made to speak or count in a low voice. The voice is then accompanied by an added whispering sound localized to one or two vertebrae, or possibly extending to the fourth or fifth. A bronchial quality to the respiration at the same place has the same diagnostic value as the whispered sound. It is necessary to be content with this, if the child is too young to speak, but the bronchial breathing is a sign of enlargement already more considerable and more extensive. It is the same with vertebral percussion."

Having read only D'Espine's articles when I began to test for the presence of this sign, I naturally took for the line dividing the normal from the abnormal, the line between the seventh cervical and first

TABLE 2.—DATA CONCERNING D'ESPINE'S SIGN

Age, Yrs.	Location	Remarks
1¾	5 D	Tuberculin test positive.
2¼	?	Typhoid fever; father perhaps tuberculous.
3½	?	Asthma.
4	3 D	Adenoids.
5	4 D	Frequent "colds"; sign gone 2½ years later.
5½	4 D	Asthma.
5¾	?	Tuberculosis of knee.
5¾	?	Just over bronchopneumonia.
5¾	4 D	Chronic bronchitis; influenza bacilli found.
6	4 D	"Below par"; normal otherwise.
6	5 D	Acute bronchitis.
6½	5 D	Bronchitis; gone seven months and three years later.
6½	4 D	Just over pertussis; had tuberculous glands in neck two years before.
6¾	?	Delicate child; known exposure to tuberculosis.
7	5 D	Acute endocarditis.
7	?	Epilepsy.
7	3 D	Recurrent bronchitis.
7½	4 D	Chronic valvular disease; sign absent five months before.
7½	?	Just over "cold"; absent two years before.
7½	4 D	Chronic bronchitis; no tubercle bacilli in sputum; tuberculin test neg.
7½	?	Bronchopneumonia.
7½	?	"Cold" for four weeks.
7¾	?	Feebleminded.
8	3 D	Delicate child; recurrent bronchitis.
8	3 D	Bronchitis and asthma.
8	4 D	Acute bronchitis.
8	3 D	Habit spasms.
8¼	?	Cervical adenitis, probably tuberculous.
8¼	?	Delicate child.
8¼	?	Known exposure to tuberculous milk.
8½	4 D	Bronchitis and asthma; tuberculin test positive.
8½	?	Masturbation; sign present two years later, but child very well.
9	?	Acute yellow atrophy of liver.
9	4 D	No disease.
9½	?	Adenoids and large tonsils.
10	1 D	Tuberculosis of lungs and cervical glands.
10½	2 D	Chorea.
10½	?	Hysteria; tuberculin test positive.
10¾	3 D	Delicate child; functional heart disease.
11	4 D	Delicate child.

dorsal spines. Both the whispered voice and the spoken voice were used in making the tests. In some cases one was more satisfactory, in others, the other. In rare instances, in the younger children, the cry was used. No conclusions were drawn from the character of the respiration alone. In 626 of the 666 children, or 94 per cent., the change in the voice sound occurred between the seventh cervical and the first dorsal spines. These figures seem sufficient to prove that in childhood D'Espine's original contention as to the location of the normal change in sound is correct. They also seem to show that those who state that the change in sound normally occurs at the second dorsal spine or, as some say, at the fourth dorsal spine, are wrong in their statements.

The fact that D'Espine's sign was present in but forty of 666 children, or only 6 per cent., shows that D'Espine's sign is uncommon in the children of the wealthy and well-to-do classes of our community. The accompanying table (Table 1) shows that D'Espine's sign is very seldom present in these children before 5 years, that it is most common between 8 and 9 years, and that its frequency diminishes from that time on.

Table 2 shows the ages at which the sign was found, the location of the change in sound when it was specified in the notes, and such other data as seem of importance.

It is, of course, impossible to analyze such a table accurately. It would seem, however, that in eighteen, or nearly 50 per cent., of the children the enlargement was probably not tuberculous. In nine it probably was tuberculous, and in thirteen there is no data pointing either one way or the other. These figures show what is now generally accepted, namely, that D'Espine was wrong in his conception that his sign was always a manifestation of tuberculosis of the bronchial glands. The presence of this sign means merely that there is some tissue between the trachea and bronchi and the vertebral column which transmits the bronchial sound unchanged, whereas under normal conditions it is modified during its transmission. This tissue is ordinarily made up of the enlarged tracheobronchial lymph nodes. The enlargement of these nodes may or may not be due to tuberculosis. These figures also seem to show that among the well-to-do-classes enlargement of the tracheobronchial lymph nodes is almost, if not quite, as often non-tuberculous as tuberculous. Too much importance cannot be attached to them, however, because positive proof as to the nature of an enlargement of these nodes can be furnished only by necropsy. It is especially noticeable how frequently they are enlarged in asthma with chronic bronchitis.

CONCLUSIONS

The following conclusions seem warranted from the study of these cases:

D'Espine was correct in his original contention that the normal change in the voice occurs between the seventh cervical and the first dorsal spines.

D'Espine's sign is present, therefore, when the bronchial voice, or whisper, is heard below the seventh cervical spine.

D'Espine's sign is uncommon in children of the well-to-do classes. When it is present in them, it is probably not a manifestation of tuberculosis in more than 50 per cent.

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