Jacobi (A.)

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A. Jacobi, M. D., Clinical Professor of Diseases of Children in Columbia College, New York.

PEDIATRICS

1896

THE MUSCLES OF RHACHITICAL INFANTS.*

By A. JACOBI, M. D.,
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THE muscles of the newly born and of the infant are feeble. The total weight of the muscles of the newly born, compared with that of the adult, is one to forty, while the relation of the skeleton is but one to twenty-six. After a while only the dynamometric effect of the child's muscles will increase. Mainly is that so after the sixth year. But even then it is only temporary and not persistent. Nor is their sustaining and persistent strength satisfactory. The frequency of traumatic joint inflammation in infancy and early childhood results from the incompetency of muscular resistance. Falls are very frequent. Squinting is common in small children, simply because their muscles of accommodation and motion are insufficient. Scoliosis is frequent even in infants and children not suffering from or affected by any ailment. Growing pains are often muscular only, and the result of over-exertion.

This is much more evident in those suffering from rhachitis. What has been called rhachitical pseudo-paralysis by Berg and others is but a confirmation of the fact that the muscular structure is insufficient. This condition may be universal or only a certain class or combination of muscles are the principal sufferers. Strabismus is particularly perceptible in rhachitical infants. With it is occasionally combined, or there is found isolated in some instances, nystagmus, which being in such cases the result of the insufficient accommodation is mostly noticed to be bilateral. In many of these exclusively muscular cases there is a motion of the head in the same or opposite direction. An instructive case of the kind was published by Caille some years ago. Scoliosis is very common in rhachitical children and those who have been so.

It is true that rhachitical children are apt to be very strong after recovery, but the pressure that children are subjected to in our schools, and the expensiveness of fresh air in large cities, and the exposure to indoor life more than one-half or more of the year in our climate allow but little Easter resurrection to our rhachitis smitten little ones. Resurrection is preached only, and from the pulpits only. Habitual scoliosis of the very young, up to the tenth year, is almost exclusively muscular, mostly dorsal, or sometimes lumbar, with the convexity usually to the left. Not being able here to follow up the cases of school children with

* Part of a paper read before the Pediatric Section of the New York Academy of Medicine.

their left arm (shoulder forward) on the table, clothing amassed under one gluteus, and defective sight, I refer only to what we see in rhachitical babies, particularly when carried on one arm only. More than healthy babies they grow scoliotic. Even when sitting in their chair, not supported by their own strength, they topple over in one direction or the other. Even before scoliosis occurs there is a general flabbiness of the muscles, which prevents free sitting altogether and causes an apparent or actual kyphosis. The latter is easily distinguished from a spondylitis kyphosis, inasmuch as it does not exhibit the same angular shape. As long as no bones participate in the deformity the diagnosis can easily be made between that caused by weakness and that resulting from actual bone disease. By raising the baby's heels and hips, while the chest and chin are supported, the apparent curvature depending on the weakened muscles will instantly disappear and lordosis rather than kyphosis will be observed.

The feebleness of the infant's muscles when intensified by rhachitical malnutrition is evidenced by nothing better than the symptoms connected with the insufficiency of intestinal muscular tissue in early life, which is exemplified in different ways.

One of the reasons why, for instance, renal disorders are not at all uncommon in the intestinal diseases of early life (the others being as I have shown but lately in a paper on "Nephritis of the Newly Born," New York *Journal*, January, 1896, the disproportion of the large renal arteries and the small capillaries, and the large size of the intestinal vessels and villi) is the feebleness of the intestinal muscle in the young, which is less capable of expelling decomposing faeces and toxines. This feebleness of the muscles shows itself, however, still more frequently in another symptom, which is quite common in rhachitical children, and even pathognomonic for early rhachitis. Take an infant born at full term, with good weight, breast fed and apparently well and increasing in weight. The bowels are reported to have been regular for four, six or eight weeks, then they become costive. There is no apparent change, the baby does not appear to be sick, is perhaps a little quieter and paler. Even the early cranial changes of rhachitis are sometimes not so perceptible as to be positive evidence of that disease. But this constipation is. Go on with the same feeding, air and other surroundings being the same, and more symptoms of rhachitis will soon develop.

In order to be certain of your diagnosis of rhachitis from this symptom, every other cause of constipation ought to be capable of exclusion ; for instance, chronic colitis and peritonitis, deficient or

viscid mucus, local atrophy of the intestinal muscle, or stricture of the intestine, perhaps even cystic tumor, though they be excessively rare. The apparent constipation which results from insufficient feeding, either intentional or not, and resulting in starvation; the super-abundance of casein in milk, of starch in artificial food; the relative absence of sugar; hardened faeces in the colon; hydrocephalus and other causes of defective innervation. Exclude also the drying up of the intestinal contents by excessive perspiration during the hot summer months, in hot rooms, under heavy clothing, or by diabetes insipidus. After excluding all these possible causes of constipation you will not fail to make your diagnosis of rhachitis, which will possibly be confirmed by other symptoms of rhachitis if you wait a short while, or rather, and that I prefer, by the effect of anti-rhachitical treatment.

The differential diagnosis is also to be made from the form of constipation which I have termed congenital constipation in the same article, *Journal of Obstetrics*, 1860, in which I discussed rhachitical constipation. In annual lectures and occasional papers, even in a discourse before the Eleventh International Congress, I have referred to the same subject because of its scientific and practical importance. It was not heeded much until some years ago, when foreign publications took up the subject; for instance, Marfan in an essay published in *Arch. Gen. de Med.* a few years ago. The facts are briefly as follows:

The embryological intestine is formed in separate divisions. There is no ascending colon before the fourth or fifth month of foetal life. In the newly born it is very short. In spite of this the large intestine of the mature foetus is longer in proportion than that of the adult. In the new-born it is three times, in the adult only twice as long as the body. This is the same proportion that is found for the small intestine, this being twelve times as long as the body in the newly born, eight times as long in the adult.

The ascending colon being very short the surplus of length belongs to the descending colon, especially to the sigmoid flexure. As the pelvis is very narrow, the great length of the lower part of the large intestine causes multiple flexures instead of the single sigmoid flexure of the adult, consequently now and then two or three flexures may be found overlapping and compressing each other. One of them is quite often found in the right side of the pelvis, and not at all as an anomaly, as Cruveilhier and Sappey thought. Huguier found it in that location so often that he proposed to operate for artificial anus on the right side in small infants.

This great length of the colon and the multiplicity of its flexures retard the movement of the intestinal contents, facilitate the absorption of fluids and render the faeces solid. Time and again have I been compelled to manually remove hardened faeces from the recta of babies otherwise normal, and fed exclusively on normal breast milk. The principal points of the differential diagnosis are consequently furnished by the time at which under the same apparently favorable circumstances constipation begins—in the "congenital" form at birth, in the rhachitical in the second or third month.

Under the ponderous heading of myasthenia gravis pseudo-paralytica JOLLY describes in the *Berl. Kl. Woch.*, No. 1, 1895, the case of a boy of fourteen whose voluntary muscles exhibited an unusual degree of exhaustibility. All of the extremities suffered, so did the eyes, the neck, the cheeks, the lips. Voluntary action and electrical irritability had the same effect on them; that is, when the former was exhausted the latter was lowered. In a similar case, however, Mosso found that when voluntary action had exhausted the muscles electrical irritability was not lost. In this condition there is neither atrophy nor hypertrophy, and no local disease like that in juvenile muscular dystrophy. This peculiar condition is rather a contrast to myotony or to the tonic contraction produced in muscles by veratria, physostigmin or digitoxin. It may be compared with the effect of curare. This makes it not improbable that we have to deal here with the results of some chemical alteration in the muscles. Still, both Mosso and Benedict found similar conditions in central disorders. The former goes so far as to speak of a bulbar paralysis not attended with any anatomical lesions.

In several instances many years ago I subjected rhachitical children of the second year who could walk to the Faradic and galvanic currents. It appeared to me that when they were tired, the electrical current had to be increased. But such patients at that early age are not favorable subjects for experimentation.

The treatment in every such case should begin with rest and with exercise gradually increased. Hydro-therapeutic measures, from warm bathing to cold friction, are indicated. Massage will improve the circulation, and chemism, and arsenic and phosphorus will probably improve the general tissue building. Veratria, physostigmin, digitoxin in small doses and given frequently may be able to restore or produce the normal tone in the feeble muscles.

A syphilitic pseudo-paralysis of the upper extremities was described by BEDNAR nearly half a century ago (*Diseases of the Newly Born, vol. iv, p. 227*). In sixty-eight cases of hereditary syphilis he

met with it sixteen times in the upper extremities, once in the lower, and twice in all of them. He explained it by muscular relaxation of peripheral, not central, origin, and saw it getting better with tumefaction of the bones, under the prolonged use of mercury.

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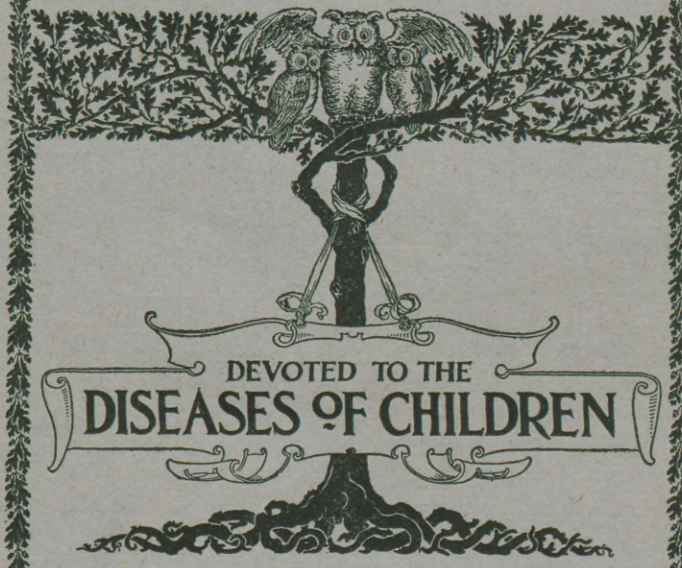

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