Remarks on orthostatic albuminuria / by F. Parkes Weber.

THE BRITISH JOURNAL
OF
CHILDREN'S
DISEASES.

PRINTED AND PUBLISHED BY ADLARD & SON,
BARTHOLOMEW CLOSE, LONDON, E.C.

REMARKS ON ORTHOSTATIC ALBUMINURIA.

By F. PARKES WEBER, M.D., F.R.C.P.Lond,,
Physician to the German Hospital, London.

Reprinted from 'The British Journal of Children's Diseases,' September, 1911.

REMARKS ON ORTHOSTATIC ALBUMINURIA.

By F. Parkes Weber, M.D., F.R.C.P.Lond.,
Physician to the German Hospital, London.

By "orthostatic albuminuria" I mean a condition characterised by the occasional, but not invariable, presence of albumin (sometimes little, sometimes much) in the urine passed when the patient is up, that is to say, has been up for some time, but not in that passed when he is in bed or immediately after he has been lying for some time in the recumbent posture—for instance, in that passed immediately after the night's rest, on getting out of bed in the morning.* The amount of albumin in the urine varies a good deal in different cases, and in the same case it varies according to the time of day, even when the patient remains up the whole day. In some cases the urine passed late in the evening, not long before going to bed, is quite free from albumin. The albuminous urine, in addition to ordinary urinary albumin (serum-albumin) sometimes contains likewise a little of the protein, formerly thought to be nucleo-albumin, precipitated by acetic acid in the cold. Thus, in the case of a young man, aged 18 years, recently under my observation, the urine passed immediately on getting out of bed in the morning was free from protein of any kind, whereas that passed at ten o'clock in the morning contained both ordinary urinary albumin and a protein precipitated by the addition of very dilute acetic acid in the cold. The urine passed at about ten or eleven o'clock in the morning is often that which contains the greatest amount of albumin, and it is an unfortunate mistake for the doctor to ask a patient to send a specimen of his "morning urine" to be tested, for in that way, in cases of orthostatic albuminuria, the patient, wishing to comply with the doctor's request, may either send a sample of urine passed immediately after getting out of bed in the morning, which

* Much of the substance of the present paper was included in the remarks I made, at the Medical Section of the Royal Society of Medicine, May the 2nd, 1911, during the discussion on the "After-history of Cases of Albuminuria occurring in Adolescents."

would be free from albumin, or a sample of the urine passed at ten or eleven o'clock, precisely that most likely to contain the greatest amount of albumin.

Though in cases of orthostatic albuminuria the time of day sometimes makes a considerable difference in the amount of albumin in the urine, even when the patient remains up and about during the whole of the day, it has been experimentally proved (in some cases, at all events) that the posture, not the time of day or the time of meals, is the chief determining cause in the production of the albuminuria in question. (There must, of course, be some other cause, but to this I shall refer later.) For instance, if a patient with orthostatic albuminuria remains lying in the recumbent position in bed throughout the day, no albumin appears in his urine, and thus it is that in hospital in-patients the presence of orthostatic albuminuria is frequently overlooked, the specimens of urine for examination being generally passed whilst the patient is, or has just been, lying in bed.

In orthostatic albuminuria the albuminous urine often contains calcium oxalate crystals, and occasionally a few red blood-corpuscles are found. The presence of these red cells may turn out to be a (temporary) genuine feature of orthostatic albuminuria, but it may on the other hand be merely connected with concomitant oxaluria. Usually tube-casts are absent, but, by the help of the centrifugal machine, a few hyaline casts and even one or two granular or cellular casts may be detected. Perhaps, however, in these cases it would be more accurate to speak of "hyaline casts containing cells or granules" than to call them typical "cellular" and "granular" casts. The administration as a "test" of calcium lactate (suggested by Sir A. E. Wright) seldom suffices, even for a few days, to remove the albumin from the urine of patients with typical orthostatic albuminuria.

This type of albuminuria occurs of course in girls as well as in boys, and possibly routine examination of the urine of children will show that its average commencement is at a slightly earlier age in girls than in boys.

I believe that amongst cases of albuminuria in apparently healthy children and young adults orthostatic albuminuria is by far the most frequent type, and I do not think that albuminuria in these apparently healthy subjects should ever be regarded as belonging to any other than the orthostatic class unless it can be definitely ascertained that specimens of the urine passed immediately on getting out of bed after the night's rest contain albumin.

My personal knowledge of cases of orthostatic albuminuria is derived from what I have observed in the young men whom I have examined as medical officer to a large insurance company, in candidates for clerkships at a London bank, and in a certain number of cases in hospital or private practice. Several young men with orthostatic albuminuria whom I have examined have been accepted for life assurance or for clerkships, and I have never heard of any bad result in such cases, nor have I heard from other doctors, or from a study of the extensive literature of the subject, of any single bad result in a case of typical orthostatic albuminuria. This is very significant if one considers the great number of cases which have been reported on.

A case which I have frequently examined and know better than others is that of a man, now aged 28 years, in whom orthostatic albuminuria has been present at least since 1907, but probably from a much earlier date. He is fond of hunting and open-air exercise of a very active kind. Sometimes his urine has contained a few hyaline casts, and sometimes there have been granules or cells in the hyaline casts. This young man feels well, and may even gain in weight when he can live the active, open-air life which he loves. He is of the tall and thin type rather characteristic of orthostatic albuminuria, and, as usual in such cases, he grew rapidly in height during early adolescence, and is rather abnormally subject to coldness and redness of the hands (the so-called "bad circulation in the extremities"). Orthostatic albuminuria was still present when I recently examined his urine. A fellow-student of mine became aware of the presence of albumin in his urine about twenty-seven years ago when working in a physiological laboratory, and many years afterwards I heard from him that the albuminuria (which was doubtless of the orthostatic type) had disappeared. Another medical man whom I know has told me that about seventeen years ago when he was nineteen years old, and was working in a physiological laboratory in Germany, he detected albumin in his urine. The urine passed immediately after getting out of bed in the morning was free from protein of any kind, but at about ten o'clock in the morning it contained a good deal of protein, partly the kind precipitated by the addition of dilute acetic acid in the cold and partly ordinary urinary albumin (serum-albumin). Late in the evening, before he went to bed, it became quite free from protein again. His case was therefore pronounced by the professor of medicine at the German University where he was studying to be an example of "cyclic albuminuria." The albuminuria

in his case continued certainly till the age of twenty-two years; it is not known at what age it finally disappeared, but his urine is now free from protein. The term "cyclic albuminuria" was first introduced for the kind of albuminuria now under discussion by Pavy* in 1885, but Moxon,† several years previously, had already recognised an "intermittent albuminuria of adolescents" (and had alluded to a "remittent albuminuria"), in which the albuminuria was specially marked after breakfast, though generally absent on rising from bed in the morning. Much time naturally elapsed before any really definite knowledge could be acquired regarding the significance (from the prognostic point of view) either of typical orthostatic albuminuria or of other forms of temporary albuminuria, such as that induced by violent muscular exercises (running and rowing in races, etc.). Now at last one is justified in asserting that the prognosis of orthostatic albuminuria is so good that no candidate for an appointment or for life assurance should be rejected merely on account of its presence, that is to say, in the absence of other points against him. Of course, however, orthostatic albuminuria may be connected with various morbid conditions, some of which are of great importance. It is not surprising that, occurring as it not rarely does in "overgrown" children and in tall, flat-chested adolescents, it should be occasionally associated with early pulmonary tuberculosis. I have observed orthostatic albuminuria in two young men with grave forms of congenital heart disease.‡ There is, moreover, no reason to suppose that true orthostatic albuminuria may not sometimes accompany albuminuria due to actual nephritis, but it is highly probable that, when its presence has been first discovered on examining the urine during or after scarlet fever, it has occasionally been incorrectly accepted as evidence of scarlatinal nephritis. Naturally, very few kidneys of patients known to have had orthostatic albuminuria have been microscopically examined. In one such case, however, slight renal "changes" were discovered, but in the light of recent examinations it appears that slight so-called "changes" in the renal cortex may be found by microscopical examination in children who have never had any signs of kidney disease. At any rate, orthostatic albuminuria cannot be

* F. W. Pavy, "On Cyclic Albuminuria," 'Brit. Med. Journ.,' 1885, ii, p. 789.

† W. Moxon, 'Guy's Hospital Reports,' London, 1878, xxiii, p. 236.

‡ F. P. Weber, "Congenital Heart Disease, with Extreme Secondary Polycythæmia and Orthostatic Albuminuria," 'Edinburgh Med. Journ.,' 1909, New Series, ii, p. 18; F. P. Weber and G. Dorner, "Congenital Pulmonary Stenosis," 'Proc. Roy. Soc. Med.' (Clinical Section), London, 1911, iv, p. 85.

reasonably attributed to the presence of such slight microscopical "changes."

For practical purposes I think that what is called "lordotic albuminuria" should be regarded as a variety of orthostatic albuminuria, in which a decidedly lordotic position acts as an essential and determining (though not the only essential) cause of the albuminuria; such a position of the body has, in fact, been experimentally proved to be a determining cause in some of the cases. On this subject much has recently been written in Germany and other parts of the Continent. In cases of lordotic albuminuria, even when the patient is kept lying in bed, the urine can occasionally be made to temporarily contain albumin by placing a bolster under the small of the patient's back, so as to produce an artificial lordosis. Thus, in a somewhat asthmatic girl, aged 12 years, who was under my observation with orthostatic albuminuria, the urine was free from albumin when she was kept lying in bed, except when a bolster was placed under the small of her back so as to produce an artificial lordosis. This was tried for about an hour on two occasions, and as a result on each occasion albumin appeared in the urine.* Of course, however, in cases of lordotic albuminuria, the lordotic position cannot be regarded as the only cause of the albuminuria, for artificial lordosis will not produce albuminuria in all children. Similarly, in other cases of orthostatic albuminuria, the upright position of the body cannot be regarded as the only cause of the appearance of albumin in the urine, for if it were so, one would expect to find albuminuria in all children and young adults, excepting when they were, or had just been, lying down. There must be some other cause, such as a functional defect of some kind or other in the renal secretory apparatus—a kind of defect which lasts only for a limited period (usually at least several years) during childhood and early adult life, and then gradually passes off. Such a theoretical functional defect would have to be supposed also to vary in degree according to the time of day, for it is only on a supposition of that kind that the occasional disappearance of the albumin from the urine in the evening before going to bed (*i. e.* the cyclical diurnal variation in the albuminuria) could be accounted for.

In conclusion, I wish to draw attention to the analogy between

* However, in another case of orthostatic albuminuria, namely, in a boy, aged 16 years, recently an in-patient at the German Hospital, Dr. H. Mendelsohn kindly tells me that artificial lordosis *in the recumbent position* failed to give rise to the presence of albumin in the urine.

renal symptoms and cardiac symptoms from the point of view of prognosis. Just as grave myocardial changes may exist without obvious clinical symptoms, so also organic renal disease may be present in people who seem to be in good health, and whose urine is sometimes quite free from albumin. Just as young persons may present cardiac murmurs, palpitation, etc., in the absence of organic heart disease, so also they may pass albumin in their urine in the absence of organic renal disease. And just as an organically diseased heart may regain its functional activity and do all the work that it is called on to do, so in cases of parenchymatous nephritis with dropsy of long duration one may occasionally observe a kind of "urinary crisis" during which, in the course of a few days, the dropsy entirely disappears owing to the kidneys having recovered their functional activity, although remaining, of course, anatomically diseased.

ADLARD AND SON, IMPR., LONDON AND DORKING.