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CYCLIC ALBUMINURIA.[1]

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THE interest and importance of this subject are the only excuse that can be offered for bringing such a hackneyed theme before the Academy. The presence or absence of albumen in the urine has been and probably always will be a matter of more or less grave importance to the practitioner, whether in examining for life insurance or in other practice. So-called "physiological albuminuria" had been suspected for some time by early investigators, but not until recently have decided views been expressed.

Sir William Gull,[2] in 1873, and Dr. Moxon,[3] in 1878, called attention to the frequent occurrence of albuminuria in youths and young persons. In these cases, however, it was temporary, passing off after a short time. Leube[4] and Fürbringer[5] made more extensive investigations which were of decided value. Leube examined the urine of 119 soldiers and found albumen in the morning urine of 5, and (after a march) in the afternoon urine of 19, and no albumen at night; about 4 per cent. had albuminous urine in the morning, and 12 per cent. in the afternoon. In no case was the amount of albumen over

[1] Read before the Baltimore Academy of Medicine, May 31, 1887.
[2] Sir William Gull: Trans. Roy. Medico-Chirurg. Soc., 1874.
[3] Moxon: Guy's Hospital Reports, 1878.
[4] Leube: Virch. Archiv, 1878.
[5] Fürbringer: Zeitschrift f. klin. Med., 1879, p. 340.

0.1 per cent., and there was also no sign of blood, neither hæmaturia nor hæmoglobinuria, nor of casts, and only occasionally uric acid crystals present. The specific gravity was always between 1.013 and 1.022. Fürbringer examined the urine of 61 children and found albumen in 7 cases, or about 11 per cent. Others have found passing albuminuria after a cold bath or active muscular exercise. Mahomed[1] found in 77 persons who came up within 12 months for life insurance examination, albumen in 12 cases, or 15.5 per cent. These cases were only examined once and in the forenoon. He feels confident that we can have albuminuria with healthy kidneys, although he lays, and with justice too, great stress upon the necessity of examining the condition of the vascular system.

Pavy[2] was probably the first to describe the cyclic character of this albuminuria. He noticed that the condition of one day was repeated with more or less exactness the next. V. Noorden[3] and Bull,[4] of Christiania, also report similar cases.

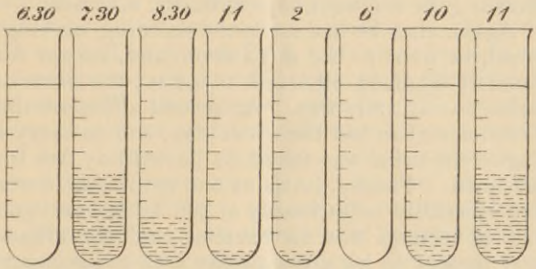
In Leyden's clinic in Berlin, a young man, a student, was found to have albumen in his urine. An assistant, Dr. Klemperer,[5] suspecting cyclic albuminuria, examined the urine day after day, taking specimens from eight different hours in the day. The patient passed his water at 6.30, 7.30, 8.30, and 11 A.M., and 2, 6, 10, and 11 P.M., taking care to empty the bladder entirely each time. The examination extended over a period of three months, and as the urine was tested under different circumstances and as the student was a very willing subject, the results are interesting. Klemperer followed a

[1] Mahomed: Guy's Hospital Reports, 1884.
[2] Pavy: Lancet, 1885, p. 706.
[3] V. Noorden: Deutsches Archiv f. klin. Med., Bd. 38.
[4] Bull: Berliner klin. Wochenschrift, 1886, No. 42.
[5] Klemperer: Archiv f. klin. Med., Bd. xii.

method which, as he says, lays no claim to scientific exactness, but still is of great use for clinical comparison. He graduated a series of test-tubes into c.cm., and took from each specimen of urine 5 c.cm. (31¼), and boiling it in the test-tube, added 2 to 3 drops of nitric acid, letting the tube stand and when the precipitated albumen fell to the bottom of the tube the height was read off and registered.[1]

The results are graphically represented in Fig. 1, which shows the amount present through the day

FIG. 1.



when the student followed his daily avocation in the ordinary routine of lectures, meals, exercise. He generally awoke at 6, arose at 7.30 and drank a cup of coffee, and at 11 took breakfast. In the morning he was either at home or attending lectures. At 1 P.M. he took dinner, at 4 he drank coffee and at 8.30 supper. He generally took a walk between 4 and 6 P.M., and usually remained at home in the

[1] To estimate approximately the amount of albumen present, we may say that when 2 to 3 per cent. of albumen is present, the whole fluid is coagulated; 1 per cent., the coagulum reaches one-half way up; 0.5 per cent., one-third way up; 0.1 per cent., one-tenth way up; 0.05 per cent., barely fills the curved part of the test-tube; when less than 0.01 per cent., there is a slight cloudiness but no precipitate.

evening. The urine which he passed on waking was free from albumen; that passed on dressing and undressing (7.30 A.M. and 11 P.M.) contained the most. From 11 A.M. to 6 P.M. he passed the least. There seems to be a fall in the morning and a rise in the evening.

When he remained in bed one hour longer than usual the urine passed at 7.30 A.M. was free from albumen, while that passed at 8.30 contained the most. On one occasion he remained in bed until noon, and then the morning urine was entirely free from albumen, and even at 2 P.M. there was only a trace, showing the influence of rest on the albumen.

Again, after he had spent the morning working as usual, he went to bed at 12 noon, and, except for a trace of albumen observed at 6 P.M., the afternoon urine was entirely free. At several different times he remained in bed the whole day, and in every instance the urine was found to be entirely free from albumen. Finally, he spent one entire day in working especially industriously at his books, not going out to lectures nor for exercise, and the albumen was present in his urine all day with a maximum at 11 P.M., thus showing the influence of mental exercise.

Nothing else pathological was found in the urine, which was in every case clear, transparent, acid, with a specific gravity of 1.005 to 1.020. The daily amount passed was 1500 to 1800 c.cm. (40 to 50 ounces). All sediment, even oxalate of lime, was absent. No sugar was present. He spent the summer in Switzerland, and the next winter returned to Berlin, having gained in weight. Examination of the urine showed a less amount of albumen which, however, still retained its cyclic manner of appearance.

While under observation the patient varied his diet, some days taking milk alone and again only meat, and all without any influence upon the amount

of albumen. As an invariable consequence of resting the urine was always free from albumen.

The following case recently came under my care. F. H., aged thirty two, stout, little color, married. He does not complain of being unwell, although his position as druggist keeps him very much confined, from 7 A.M. to 12 midnight. He gave no history of gout, rheumatism, nephritis, or syphilis, but had had intermittent fever. Examination of the heart and radial pulse showed nothing abnormal. He saw very well. He applied about eighteen months to two years ago for admittance to a life insurance company, and was much surprised to find that he was rejected on account of albumen in his urine. He was told he would die in a few months, and was naturally much frightened, although at the time he felt very well and had a good appetite. He consulted many physicians, and took different things, changing his diet with each physician, and examining his urine himself very carefully, as he had abundant opportunity of doing. He noticed, as time went on, no great change; now there would be less albumen, now more, and occasionally none. In one of these happy, non-albuminuric intervals he again applied for life insurance, but unfortunately for him, by the time the examiner reached him albumen had again appeared in his urine.

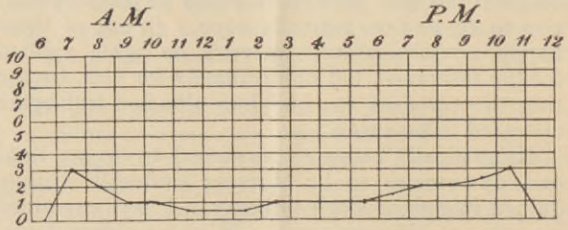
He gradually became accustomed to his position, and now seems to be thriving under it, having gained in weight since last year. I have examined his urine at different times and under different circumstances in the past few months, and have rarely failed to find albumen. For the sake of comparison I have followed the method employed by Klemperer, not, however, neglecting to test the urine with other reagents.

The amount passed per day was about thirty to forty ounces in cold weather; it was acid at every

test, and the specific gravity (taken at every test) ranged between 1.019 and 1.031. Examination of the sediment microscopically showed only oxalate of lime and uric acid crystals, and no casts. He also informed me that none of his attending physicians had ever found casts. The specific gravity reached 1.030 and 1.031 on a few occasions, and then the albumen was most abundant.

In using the layer test of Heller I was occasionally struck with the intense color of the ring of urates above the acid, and have since had my attention called to a statement of Dr. Sedgwick Saunders, who, in making tests for Ralfe,[1] noticed that on the days when the albumen was most abundant, the specific gravity was above the normal, whilst the ring of urates which formed just above the cold nitric acid on which the urine was floated, when the albumen was most abundant, was always intensely colored by the oxidized pigment of the urine.

FIG. 2.



Shows the average daily amount of albumen passed for each hour.

Unfortunately I was unable to get specimens of urine at stated hours from my patient, as Dr. Klem-

[1] Ralfe : British Medical Journal, November 27, 1886.

perer did from his, still I found him ever ready to assist me in saving the urine in bottles, and in carefully noting the hour. The result of an ordinary day's work on the excretion of albumen was much the same as in the preceding case. On one day he did not go to work until 2 P.M., and arose that morning at 8, two hours later than usual. He awoke at 5, and passed a non-albuminous urine; at 8.15 he arose and dressed, and at 2 P.M. he went to the store. The amount of albumen shows a tendency to increase toward evening. He feels very well and cheerful, and his only desire is to have his life insured.

Without going into the pathology of this disease, it is evident that rest and work play an important part in its etiology. The most generally accepted theory is that some change in the epithelium covering the glomerular vessels allows the albumen to pass through into the urine—a condition which the normal epithelium prevents. An extended and careful observation can alone give a decided diagnosis. I have used the heat test, the nitric acid test, nitric acid and heat, picric acid, and the nitric-magnesian test of Roberts, and I think that no one should be satisfied with a single test.

As for the prognosis, Leube, Fürbringer, Moxon, and Mahomed would no doubt be in favor of insuring persons with cyclic albuminuria, while Johnson,[1] and others, hesitate, and seem to think that such cases probably end in some form of nephritis. Dr. Munn,[2] as Medical Director of the United States Life Insurance Company of New York, finding that nearly ten per cent. of all deaths of policy-holders in his company occurred from some form of Bright's disease, made an extensive examination of the urine

[1] George Johnson: British Medical Journal, 1879, II.
[2] John Munn: Medical Investigations in Life Insurance.

of all applicants from 1877 to 1880. He used the heat and nitric acid test, holding the test-tube containing the urine before a reflected light. He lays great stress upon the care with which the urine should be examined—*i.e.*, acidified, if alkaline, and allowed to stand a sufficient length of time after the addition of the acid. In following up the histories of the rejected cases, he found, in 1880, that four had died out of sixty-nine, and the general health of those who had been under observation for more than one year was gradually deteriorating, and for this reason he was inclined to regard albuminuria as of grave significance.

Without attempting to draw any inference from these cases, I think one or two points deserve notice. When a urinary examination is to be made, the applicant for life insurance should bring specimens passed in the forenoon and afternoon as well as at night. If albumen be present, a sufficient number of examinations should be made before a diagnosis between a nephritis and cyclic albuminuria be made. In every case a microscopic examination should be made, as casts may be present when albumen is absent. Of course, so-called accidental albuminuria, due to gonorrhœal pus, or to some inflammation in the ureters or bladder, should not be mistaken for Bright's disease.

Treatment seems to have little or no influence upon this form of albuminuria. Ralfe seems to think that time alone, and not drugs, will cure it. Saundby,[1] also, admits that he could never cure one of these cases. My patient is at present taking iron in the form of the tincture of the chloride, but at the time the above test was made all medicine was purposely withheld.

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1 Saundby: British Medical Journal, November 27, 1886.