

may follow poisoning by arsenic and other minerals. In any severe disease, such as scarlet fever or diphtheria, the amount of extra waste produced in a given time is very great, and not only is the amount greatly increased, but, because the system is labouring under the disadvantage of disease, the ordinary products of tissue change—the ashes of the human stove—are incomplete, and add considerably to the renal irritation.

For a time the cells may be able to cope with this extra demand, but if the work required of them is too excessive, they will become exhausted, and the changes referred to will take place.

All trained nurses are familiar with the words "tube casts," "granular," and "hyaline" casts, &c., as applied to urinalysis, and it may now be seen where these come from. When these overworked cells die, they drop from their places in the membrane lining the tubes, and if their number is sufficient to fill any tube completely, they form a "cast" of that particular tube. This, in time, becoming detached, appears under the microscope in the urinalysis.

When these changes arise from some acute constitutional disease, as scarlet fever, puerperal fever, &c., the walls of the tubes may be restored to normal condition if the irritation is not too severe or too greatly prolonged, that is, after the primary disease has abated.

The symptoms which characterise this variety of kidney diseases are such as might be expected to follow from the non-elimination of effete products from the blood. These worn-out and useless substances, chiefly urea, continue to circulate through the system, and by constantly irritating the various nerve centres, produce a variety of disturbances of a functional character.

One of the most prominent of these symptoms is headache, usually confined to the back of the head. There may be also digestive disturbances, loss of appetite, nausea, &c., but as these symptoms are so common in many other diseases, they cannot be relied upon in the diagnosis of renal diseases.

More important, because more distinctive as a symptom, is general oedema. It is first observed under the lower eyelids and around the ankles. Whenever such serous effusion appears it should be a signal to examine the urine for disease of the kidneys. In the urinalysis the distinctive signs of disease are clearly brought out. The amount of urine voided in a given time is diminished; it is high-coloured, and albumin is always present. On microscopical examination the hyaline and granular tube-casts are seen, but not casts containing blood, as found in acute diffuse nephritis.

*Chronic parenchymatous degeneration of the*

kidneys differs from the acute form in this, that it does not tend to recovery. It generally follows from acute attacks, which may have passed unnoticed. There is here the same degeneration of the cells as in the acute form, and this eventually so impairs the kidneys that so-called Bright's disease supervenes.

The nurse who is fully cognisant of the way in which this lesion is brought about will guard the renal cells most sedulously, especially when the kidneys are called upon to do extra work. This will, however, be referred to more fully under the heading of treatment and nursing.

The symptoms of this variety of kidney diseases are very vague at first, and are not essentially different from those of acute parenchymatous degeneration. As the disease advances the blood becomes so impoverished that the patient presents a peculiar waxy appearance, the skin being almost translucent in hue. Later on, when the oedema becomes excessive, various other symptoms appear, but as these are present in all chronic forms of kidney disease, they will be described in treating of chronic diffuse nephritis.

The urinalysis shows a large quantity of casts, especially the coarsely granular and fatty casts, and there is much *débris* of broken-down cells and cast-off matter.

This is the condition of the renal organs that is often met with in pregnancy. With removal of the cause the tendency is towards recovery, but there is no doubt that repeated attacks of this disease associated with pregnancy, leave a lasting mark upon the essential cells of the kidneys.

*Acute diffuse nephritis* is a true inflammation of the organs involving not only the parenchyma, but the interstitial tissues as well. Migration of blood corpuscles from the blood-vessels being one of the essential features of any inflammation we find this phenomenon present in acute diffuse nephritis, but absent in the two forms previously studied. The tissues between the tubes become infiltrated with the products of inflammation, and as a result the kidneys are very much enlarged.

This form of kidney disease follows from such diseases as scarlet fever, and is often produced by severe colds, chilling of the body, &c., and may be met with after extensive burns.

The symptoms usually are an initial chill, pain in the back, difficult and frequent micturition and a diminished quantity of urine. The case may go rapidly on to complete suppression, uræmic poisoning, convulsions, coma and death. In milder cases dropsy is one of the first symptoms observed, and coincident with it may be nausea, headache, dimness of vision, &c.

(To be continued.)

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