A LECTURE ON DIAGNOSIS AND PROGNOSIS IN CASES OF BRIGHT'S DISEASE.

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GENTLEMEN,—In the Nomenclature of Disease published by the Royal College of Physicians, Bright's disease is defined as "a generic term including several forms of acute and chronic disease of the kidney, usually associated with albumen in the urine, and frequently with dropsy, and with various secondary diseases resulting from deterioration of the blood." It is manifest that the prognosis in cases of this disease, as thus defined, must vary extremely. The difference, as regards prognosis, between a case of recent acute Bright's disease, such as frequently results from scarlet fever or from exposure to cold, and a chronic advanced degeneration of the kidney, such as often complicates various enfeebled and cachectic states of system, is immense. How, then, are we to learn whether the disease is acute or chronic? and, having ascertained that it is chronic, how are we to determine the stage of the disease and the rate of its progress? These are very important practical questions, which I will now endeavour to answer. And first I desire to impress upon you that, in order to avoid errors of diagnosis and prognosis in these cases, you must neglect no available source of information. Note every fact in the past history of the patient, observe closely his symptoms and his present condition, and carefully examine the urine with reference to its general physical and chemical, and in particular as to its microscopical, characters; and, having done this, you will in most cases have the materials for a confident opinion as to the nature and the probable result of the disease. The error into which an inexperienced practitioner is most likely to fall is that of mistaking advanced chronic disease for an acute attack. Chronic Bright's disease is often most insidious in its commencement and its progress, and it not unfrequently reaches a very advanced stage before its presence is suspected. The sudden onset of distressing and alarming symptoms is often the result of a disease which, though latent, has existed for many months before. I have seen not a few cases in which the general symptoms and the history appeared to point to renal disease of recent origin, when a careful examination of the urine clearly indicated chronic disease in an advanced stage. Until the practice of testing the urine in all cases of deranged health becomes universal, chronic Bright's disease must often be overlooked.

The urine in cases of acute Bright's disease is usually scanty, of normal specific gravity, more or less blood-tinged, highly albuminous, and contains numerous epithelial and blood casts, with scattered renal epithelium and blood-discs. (See Fig. 1.) The hæmaturia of acute

* Fig. 1.—*a a*. Epithelial Casts. Casts of the Uriniferous Tubes entangling Renal Epithelium and Blood-corporcules. *b*. Scattered Renal Gland-cells and Blood-corporcules. *c*. Pavement-epithelium from the Vagina. X 200.

Bright's disease is distinguished from that of renal calculus by the fact that in the former class of cases the blood, escaping from the substance

of the kidney, is partly moulded within the tubes, therefore blood-casts (Fig. 2) appear in the urine; whereas, in cases of renal calculus, the blood,

Fig. 2.—Blood-casts composed of fibrine entangling blood-discs. X 200. coming from the pelvis of the kidney, is not moulded within the tubes, and no blood-casts are seen.

In addition to the epithelial casts and blood, there may be seen, in most cases of acute Bright's disease, some small and large hyaline or waxy casts. (See Fig. 3.)

Fig. 3.—*a*. Large Hyaline or Waxy Casts. *b*. Small Hyaline or Waxy Casts. X 200.

The difference between a small and a large hyaline cast is readily explained by a reference to Fig. 4.

The small casts are moulded within the canal whose walls are formed by the gland-cells; while the large casts are formed within

Fig. 4.—Portion of an Uriniferous Tube. The lining of glandular epithelium leaves a clear canal in the middle, which is equal to about half the diameter of the tube. X 200.

tubes from which the gland-cells have been removed. The diameter of these casts is therefore equal to that of the uriniferous tubes whose basement-membrane constitutes the mould in which the casts have been formed. In cases of acute Bright's disease (desquamative nephritis), the small hyaline casts are often present in great numbers; while the large casts are less numerous, or entirely absent. I shall presently show you that the large hyaline casts have great significance in the advanced stages of chronic Bright's disease.

There is yet another form of tube-cast which is often seen in cases of acute Bright's disease. The casts to which I refer contain small round cells (exudation-cells), having the size and appearance of pus-cells, and showing compound nuclei on the addition of acetic acid. (Fig. 5.)

These exudation-cell casts are often mingled in variable proportion with the epithelial casts in cases of acute Bright's disease; but they are sometimes present in great numbers without epithelial casts. In some cases, the exudation-cell casts are present from the commencement of the disease; in other cases, the epithelial casts, which were seen at the beginning of an acute attack, are gradually replaced by the exudation-cell casts. The appearance of these casts in great numbers is a less favourable prognostic sign than when epithelial casts alone are present.

In some undoubted cases of acute Bright's disease, the urine, though highly albuminous, contains no blood, and retains its normal colour;

there is little or no epithelial desquamation, and there may be no tube-casts, or the small hyaline casts may be present in variable numbers. These cases are comparatively rare; but I have notes of several that have been carefully observed from the commencement of the disease to its termination in complete recovery.

Fig. 5.—Casts entangling small round Exudation-cells, from a case of Acute Bright's Disease. *a b c*. Casts crowded with cells. *d*. Scattered cells. X200.

When symptoms of acute Bright's disease have continued beyond a month or six weeks, we frequently find that more or less oil begins to appear in the tube-casts and in the desquamated renal epithelium. (See Fig. 7.) These appearances naturally cause some apprehension of incurable degeneration of the kidney; but I have seen many cases of complete recovery after oily casts and cells in great numbers have appeared in the urine for several weeks in succession.

Acute Bright's disease is essentially a curable disease, as much so as acute bronchitis or acute pneumonia. The prognosis is, on the whole, more favourable in the young and middle-aged than in those who are more advanced in years. It is, for obvious reasons, more hopeful when the patient is able to avoid exposure to cold and other hurtful influences, than when circumstances are less favourable for his recovery. The sooner the patient comes under treatment, the better is his prospect of recovery; and, on the other hand, the longer the symptoms continue without signs of amendment, the more grave does the prognosis become.

In favourable cases, a copious secretion of urine, of comparatively low specific gravity and of pale colour, with a diminishing amount of albumen and decrease of dropsy, are amongst the earliest signs of amendment. Albuminuria is usually the last symptom to disappear. The time of its disappearance varies, in different cases of recovery, from a few weeks to many months. If the urine continue albuminous for more than six months, it becomes more and more doubtful whether it will ever cease to be so; but I have seen cases of complete recovery after albuminuria had continued for one, two, and even three years. So long as the urine continues albuminous, in however slight a degree, although the dropsy and all other general symptoms may have passed away, recovery must be considered incomplete. Acute Bright's disease, although, as a rule, a curable, is not unfrequently a fatal disease. There are some symptoms and complications which indicate a case of more than ordinary peril; such as a very scanty secretion of highly albuminous urine; frequent and distressing vomiting; extreme general dropsy, more especially dropsical effusion within the chest, either in the pleura or the pericardium, or both, with urgent dyspnoea; inflammation of the lung, or pleura, or pericardium, or endocardium; severe and persistent headache, which is apt to be followed by convulsions and by coma, with a brown and dry tongue. All these are symptoms of grave, though not always of fatal, import. When the renal disease is acute, and therefore curable, recovery sometimes occurs after the most formidable symptoms of uræmic poisoning have been present.

With regard to dropsy as a symptom of acute Bright's disease, you will observe that it occurs chiefly when the functions of the skin, as well as those of the kidney, are impaired. Thus it is usually present when the renal disease is a result of scarlet fever or exposure to wet and cold. But dropsy is not an ordinary result of the acute renal disease which is often associated with diphtheria.

A consideration of the exciting causes or the renal disease forms an element in the prognostic indications. When Bright's disease results from some inherent constitutional defect, without obvious exciting cause,

it is generally more intractable than when it is directly due to exposure to cold or to the influence of some specific blood-poison, as, for instance, that of scarlet fever, typhus, or erysipelas. Puerperal albuminuria, as a rule, passes away quickly after parturition. To all general rules of this kind there are exceptions, and each case requires a separate and careful study.

Cases of chronic Bright's disease arrange themselves anatomically in two very distinct classes: 1, cases of small red granular kidney—chronic desquamative nephritis; 2, cases of large white smooth kidney. The clinical history of the two classes of cases is as distinct as their anatomical characters. The degenerative changes which result in the small red granular kidney are always chronic from the commencement. This form of disease is rarely, if ever, a sequel of an acute inflammatory process in the kidney. The one constant and essential feature of this disease is a gradual disintegration and destruction of the gland-cells within the uriniferous tubes. The disintegrated cells appear in the urine in the form of "granular casts" of the tubes; and the amount of this deposit in the urine is a measure of the rate at which the destruction of the glandular tissue is proceeding. (Fig. 6.) As the de-

Fig. 6.—*a a*. Granular Casts. *b b*. Large Hyaline or Waxy Casts. X200.

generative process advances, the uriniferous tubes gradually lose their glandular lining, and large hyaline casts indicate that the tubes in which they were moulded have been entirely denuded. The urine is now pale, copious, of low specific gravity, moderately albuminous, sometimes quite free from albumen. Dropsy, if it appear at all, is limited in extent, and occurs only in the last stage of the disease. Painful muscular cramps in the legs are of common occurrence in the advanced stages of the disease. Common modes of death are by uræmic convulsions, or coma, or cerebral hæmorrhage.

Death is sometimes preceded for some days by a state of torpor and drowsiness, with a brown and dry tongue, sordes on the teeth, and a peculiar and characteristic urinous fætor of the breath; the general aspect of the patient being very like that which occurs in some cases of fever. More than once I have known this uræmic oppression mistaken for typhus or for enteric fever. The difficulty of diagnosis is increased by the fact that, in cases of typhus and enteric fever, where there is much cerebral oppression, the urine is often scanty and more or less albuminous, and it sometimes contains granular casts. A close attention to the entire history of the case, and a careful examination of the urine, will seldom leave you in doubt. The specific fever-eruption, when present, is decisive. The thermometer will assist you. The temperature is higher in fever than in simple uræmic poisoning. And, with regard to the urine, remember this: that although in a case of fever, as also in some cases of pneumonia and erysipelas, there may be an acute and transient disintegration of the renal gland-cells, and consequently the tube-casts may have the granular appearance which might appear to indicate chronic desquamative nephritis, yet there is this difference, that whereas, in the advanced stage of chronic desquamative disease, the urine is always of pale colour and of low specific gravity, the albuminous urine in cases of acute febrile disease is usually of deep colour and of rather high specific gravity. Once, in a case of acute pyæmia, I found the urine albuminous, and containing large granular and large waxy casts, such as are represented in Fig. 6; and I concluded that there was an advanced stage of chronic desquamative disease. The *post mortem* examination showed that the renal disease was a recent result of the pyæmia. If I had taken into consideration

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the fact that the urine was of deep brown colour and of normal specific gravity, I should have avoided this error of diagnosis. You see that, although the observation of the various forms of tube-casts is of great assistance in diagnosis and prognosis, yet a too exclusive reliance upon this microscopic evidence may sometimes mislead you.

[To be concluded.]

ABSTRACTS OF LECTURES

ON THE
GEOGRAPHICAL DISTRIBUTION OF DISEASES IN
ENGLAND AND WALES.

Delivered at St. Thomas's Hospital, London.

By ALFRED HAVILAND, ESQ.

III.

Geographical Distribution of Phthisis (in Females) in England and Wales.

IN my two last lectures, I endeavoured to show how unexpected the results are when we group the mortality returns of our country according to certain degrees of mortality regulated by the proportional number of deaths from any one cause to a given number living in each of the 623 districts, the 53 counties, or the 11 divisions. You will remember that, in describing the geographical distribution of each of the causes of death, which formed the subject of my lecture, I used three different tints of the two colours, *red* and *blue*. The most intense *red* represented the *sixth* or lowest degree of mortality, and the most intense *blue* the *first* or highest degree of mortality. The tints of the degrees between these extremes decreased in intensity as they approached the average, below which the degrees were coloured *red*, and above it *blue*. We may fix in our memory the object of these colours by remembering that the *red* represents *healthy* districts, so far as regards the cause of death discussed, and is the typical colour of healthy florid *arterial* blood, whereas the *blue* indicates the high mortality or unhealthy localities, and is the symbol of *blue*, effete, and unhealthy *venous* blood.

Having laid down a law that each of the divisions, counties, and districts, shall be coloured according to its proportional mortality from any one cause of death, we carry this into effect and study the result. This we have done in the case of heart-disease and dropsy, and cancer in females. It will be now my duty to lay before you the statistics of phthisis in females, grouped according to the proportional mortality in each of the divisions, counties, and districts; but, before doing so, it will be first necessary to refer to my previous two lectures, for you will find in the sequel, as I have already done, that these maps of disease have to be studied side by side as we progress in the series. The distribution of each cause of death forms a distinct problem to be solved only by the light of our knowledge of the physical, climatic, social, and other factors, which either singly or collectively regulate it in the first instance, and then by the light of the fresh information conveyed to us through the unexpected results of our investigations.

Heart-disease and dropsy I made my starting point and my first problem; and in my second lecture I endeavoured to show you what were the climatic facts coincident with the high and low mortality from this cause of death. We shall now see that they bear a remarkable relation to the facts which the distribution of phthisis discloses; and, moreover, the distribution of cancer in females we found had a remarkable and distinct character of its own, which it will be impossible, in discussing that of phthisis, to overlook.

The result of our investigation of the distribution of heart-disease and dropsy was the following proposition: "That, wherever the prevailing sea-winds have uninterrupted access, as over a flat or elevated country, or up broad vales or valleys, there we found a low mortality; and that, on the contrary, in localities where the tidal wave has no access, where the rivers run at right angles to its course or to that of the prevailing winds, and where the districts are sheltered by lofty hills from the full sweep of the sea-winds, there we find the highest mortality."

This proposition arose out of the following leading facts: 1. That the most exposed divisions form a red arch of low mortality around the blue midland divisions of high mortality; and, 2. That the division of the northern and southern counties which are protected by a precipitous coast line, and where the rivers run at right angles to the prevailing winds and tidal wave, had a mortality *above* the average. Again, when we analysed the counties, we found that in the high mortality divisions the death-rate of the most midland counties diminished, those having a low mortality which skirted the coastal counties, and that four of the

counties, the most sheltered from the prevailing winds, have the highest mortality; and that in the low mortality divisions, such as the South Midland (VII), Yorkshire (IX), and Eastern Counties, the most sheltered counties had the highest mortality; and lastly, when we came to the east division of the districts, it was readily seen that low mortality obtained wherever there were great sea-inlets, such as the Thames, the Wash, and the Bristol Channel, besides along the banks of tidal rivers which gave free access to the prevailing winds, such as the Parrett, Avon, Severn, and Gloucestershire Avon.

The movement of our atmosphere is called wind; and, immediately a calm ceases, a new quality is added—force. I shall call it the dynamical element of wind in contradistinction to its chemical, which involves its purity as well as impurity.

The facts that I have just shortly given point at once, I think, to the probability that the dynamical element is the great factor which regulates the distribution of heart-disease and dropsy. When looking at the map of this cause of death, we seem to be told that the prevailing sea-winds sweep a something before them by their sheer power, which is the cause of that kind of heart-disease which dominates the geographical distribution of heart-disease generally. Whether whilst thus purging by force these winds destroy chemically the *materies morbi*, is a problem which may eventually be solved, but of which I can say nothing at present, although the opinion that they do has much to support it.

Let us now compare this map of the distribution of heart-disease in the divisions with

The Geographical Distribution of Phthisis (in Females) in the Eleven Registration Divisions of England and Wales.—During the decade from 1851 to 1860, more than half a million of the population of England and Wales died—according to the medical certificates of duly qualified practitioners in medicine—of that most fatal disease, phthisis (508,923). Of this gross sum, more than a quarter of a million (269,618) were females; and I have selected the distribution of deaths from this cause among the female population, first, because the numbers are sufficiently large to justify me in doing so; and, secondly, because I am desirous of comparing the geography of this cause of death with that of cancer among the same sex.

On looking attentively at the two divisional maps before you—one of heart-disease and the other of phthisis—you will at once be struck with the remarkable fact, that they are the reverse of each other: for instance, the series of low mortality divisions in the heart-disease map, which extends from the north of the Bristol Channel around to the eastern coast, and ends on the north bank of the river Thames, is coloured *red*, indicating a mortality *below* the average. In the map of phthisis, you will see that these very divisions are coloured *blue*, in order to indicate that their death-rate is *above* the average.

This series of divisions includes Wales, the North-Western Counties, Yorkshire, the North Midland and the Eastern Counties. All are well exposed to the direct and immediate influence of the sea-winds, coincident with which I have shown that low mortality from heart-disease almost invariably obtains. These are the divisions that receive the brunt of our powerful winds, which sweep over them as it were unobstructed. They derive all the benefit which the dynamical element of our atmosphere in motion can accord; they are the least protected and least sheltered of all the eleven divisions.

In the map of phthisis, all these exposed divisions have a mortality *above* the average; we, therefore, are led to conclude that this free exposure to the force-element of wind is coincident with a high mortality from phthisis.

Again, the midland, the northern, and the southern divisions, which are the least exposed to the winds, have a high mortality in heart-disease and a low mortality in phthisis. The high mortality in heart-disease we found coincident with the sheltering influence of the elevated ridges which form deep valleys, where a thorough air-flushing cannot take place. We have something therefore foreshadowed in this divisional map of the geography of phthisis. The average annual rate of mortality from phthisis to every 10,000 females living is 27.7; and the scale I have adopted is in conformity with those used in describing the maps which formed the subjects of my two last lectures.*

The first or highest degree of mortality is coloured with the darkest blue, and the proportional mortality is from 37 to 40 and upwards to every 10,000 living; the second degree, having a shade lighter, is from 33 to 36; and the third degree, or lightish blue, from 29 to 32. The fourth degree, the one at and below the average, ranges from 25 to 28; it is the lightest pink tint. The fifth degree has a deeper red, and ranges from 21 to 24; and lastly, the sixth degree, that of the least mortality,

* The accompanying map is a reduction by photolithography to one-eighth the size of the original exhibited at the lecture; and the rates of mortality *above* the average are represented by shades of *black* instead of *blue*; those below are *red*, as in the original.