

# EDINBURGH MEDICAL JOURNAL.

---

## ORIGINAL COMMUNICATIONS.

### THE TREATMENT OF RENAL DROPSY. ✓

By NESTOR TIRARD, M.D. (Lond.), F.R.C.P., *Physician to King's College Hospital, and the Evelina Hospital for Sick Children, London.*

WHEN the British Medical Association met in Edinburgh, last July, I had the honour of introducing a discussion on the "Treatment of Chronic Renal Disease." During this discussion, the views expressed by various speakers indicated considerable divergence of opinion upon many matters that I had previously deemed to be generally agreed upon, and accordingly, as the time for reply at these meetings is necessarily limited, I have gladly availed myself of this opportunity of restating the general principles of treatment, which I consider advisable in the course of kidney disease.

In the following short course of papers I propose to deal with some of the more prominent symptoms of both acute and chronic kidney disease, and I have the less hesitation in taking this broad view of the subject, since the limits originally assigned to the discussion were not strictly adhered to by many of those who spoke; and, moreover, it seems to me that it may be serviceable to consider the treatment both for acute and chronic conditions. In the present paper I propose speaking chiefly of the treatment of dropsy, resulting from renal disease.

Renal dropsy occurs in two perfectly distinct forms: in the form associated with acute nephritis, where the œdema is general but often makes its appearance first about the face; and, secondly, in connection with chronic nephritis, where the œdema, although occasionally general, is more frequently of a type resembling that met with in connection with cardiac failure, or with respiratory troubles.

The dropsy of acute nephritis develops rapidly, and is associated with marked diminution in the daily excretion of urine

and with well-known alterations in the urine, such as the appearance of blood, or the presence of lithates, and, when examined microscopically, the presence of free blood corpuscles, of blood casts, and of renal epithelium, which may be entangled so as to form epithelial casts. With these conditions patients may complain of sickness and of severe headache, while very commonly the diminished urinary excretion is associated with abnormal frequency of micturition, small quantities of urine being voided at a time with much discomfort.

The above indications form a fairly complete picture of the onset of an attack of acute nephritis, whether it results from cold, or whether it occurs as the sequel to an attack of scarlet fever; and the symptom which, in all probability, is the first to attract attention is the dropsy, which, in a few hours, completely alters the appearance of the patient, the face becoming puffy and pale, owing to the œdema in the subcutaneous tissues, the features being obliterated and the eyes almost closed. This alteration in the features is accompanied by general effusion in the subcutaneous tissues all over the body, so that the extremities and the trunk become swollen and disfigured, while movements are rendered difficult, owing to the infiltration of the subcutaneous structures round the joints.

Although the above account represents the first appearance of the dropsy of acute nephritis, after a few days the fluid tends to gravitate, so that, while the tissues over the chest and abdomen appear of more normal shape, there will be even greater distortion or deformity of the loins, with the development of the lumbar pad, which is, however, perhaps rather more characteristic of the dropsy of chronic nephritis.

To a great extent, the degree of swelling corresponds with the diminished excretion of urine; hence the continuance of renal dropsy is to be regarded with considerable distrust and anxiety, for although the dropsy does not, in itself, threaten life, yet as an indication of the probable extent of engorgement of the kidneys in acute nephritis, our efforts in dealing with this disease must primarily be directed to the relief of dropsy.

With acute nephritis there are three dangers to be kept well in mind. These are—(1) The immediate danger of suppression of urine; (2) the danger of interference with respiration and with the circulation; (3) the more remote danger of chronic renal changes, which will, in all probability, result from the accumulation of effused blood around the capillaries of the glomerulus and within the renal tubules.

In considering these three sources of danger, it will be found that the most satisfactory treatment is that by which the dropsy is reduced most rapidly; and indeed, though I have headed this paper "The Treatment of Renal Dropsy," it is necessary to remember that to a large extent, in the treatment of renal dropsy,

we must include a consideration of the general management of acute and chronic nephritis.

The treatment of the dropsy of acute nephritis must include measures which will meet the threefold dangers above indicated; and since the most imminent danger is that resulting from suppression, this demands the first consideration.

To obviate the dangers of suppression, it is necessary to restore the interrupted functions of the kidney as early as possible, so as to favour the renewed elimination of nitrogenous waste. Since, however, the arrested action is associated with extreme engorgement of the renal vessels, any measures calculated to increase this engorgement must be deprecated; and our efforts must primarily be directed towards the relief of the results of the engorgement, and at the same time to the removal of the existing over-distension of the renal vessels.

The three main channels for the removal of fluid from the blood vessels are the skin, the intestine, and the kidneys; and their respective excretory functions can be stimulated by diaphoretics, by hydragogue purgatives, and by diuretics. The employment of diuretics is contra-indicated in the early stages of acute nephritis, since the majority of these remedies would cause an increase in the calibre of the renal vessels, and would thus promote the engorgement which it is desirable to relieve. Hence, so far as remedial measures are concerned, at the commencement of treatment we are almost entirely dependent upon diaphoretics and upon hydragogue purgatives.

I am well aware that some observers, and notably Sir William Roberts, advocate the early use of drugs intended to render the urine alkaline, hoping in this way to prevent the coagulation of blood or of albumin within the tubules. When such coagulation arises it undoubtedly adds largely to the risks of the subsequent development of chronic nephritis, and coagulation is certainly more likely to occur when the urine is highly acid. It has also been urged that not only remote, but also immediate dangers are diminished by this form of treatment, and Sir William Robert states that in no instance, where the urine has been rendered alkaline during the first week of the complaint, has he observed the more severe uræmic symptoms or secondary inflammations. To effect this object it is necessary to employ either potassium acetate or citrate, or the salts of sodium, which are converted into alkaline carbonates within the body. These compounds have, however, a powerful diuretic action, and I consider, therefore, that their use before the initial engorgement is relieved is not devoid of risk. They are valuable when an increase in the urine eliminated, and a decrease in the blood-red colour indicate that the primary engorgement has subsided, and that the circulation through the kidney is again tending to the normal condition; but, so long as the urine is blood-stained and scanty, I prefer to

rely upon other measures for the relief of the more urgent symptoms.

By securing rapid action of the skin we are generally able to insure diminution of dropsy, and thus to afford relief from severe and persistent headache, which is so frequently a prominent symptom. The action of the skin may be favoured by baths, by drugs, and to some extent by copious draughts of liquids. The measures adopted must to a great extent be determined by the circumstances of the patient, and by the amount of nursing assistance which is available; but a little ingenuity will readily overcome difficulties, and permit the early employment of almost any desired form of treatment. Rapidity of action may often be secured by the use of the hot-air or vapour bath, and it is in this connection that the greatest amount of ingenuity will be required. In a well-appointed hospital it is easy to administer a vapour bath, since the necessary apparatus is always at hand. This consists of a large steam-kettle, which is placed at the foot of the bed, with its tube projecting a short distance through a wooden partition into the space at the foot of the bed. The bed-clothes are raised around the patient by a large cradle, similar to that employed in the surgical treatment of fractures of the lower extremity. Two of these cradles, if necessary, may be used so as to increase the space surrounding the patient, and the cradle is then covered with blankets which are closely fitted round the patient's neck, so that his body is completely surrounded with warm, aqueous vapour. It is necessary to fix the tube of the steam kettle in a position where it can by no possibility come into contact with the patient's limbs, since otherwise considerable damage may be done, the cutaneous sensibility of dropsical patients being so greatly reduced that severe blistering may result before there is any complaint of discomfort.

In cottages the vapour bath may be sometimes employed by seating the patient in a chair, under which a lamp with a large wick is allowed to burn, the patient being surrounded with blankets. This proceeding is, however, extremely hazardous, as there is danger of the lamp flaring and setting light to the wood-work, or to the bed-clothes. But, independently of this danger, this form of vapour bath is objectionable, since it requires a patient to be placed in an erect posture when, in all probability, he is in a condition of extreme weakness; and dropsical patients are notoriously heavy and difficult to move. The vapour bath, however, may, with a little ingenuity, be easily arranged, even in a cottage; the bed clothes may be temporarily raised sufficiently by low stools, such as are to be found in most country cottages, or, if these are not available, a few barrel hoops and a pole may be tied together so as to form a good imitation cradle. Yet even then, there is the difficulty of arranging the lamp with safety, and in general it is felt to be easier and safer to

promote the action of the skin by the use of wet packs or by warm baths; of the two, the wet pack is far more easy to manage, since it involves no apparatus, and entails less movement of the patient.

The wet pack may be either hot or cold, and it does not appear to be of much importance which form is adopted. If the cold pack is employed, it is only really cold at the moment of its application, since, as a rule, the cold speedily excites a strong reaction, which serves to warm the sheet and to surround the patient with warm vapour. On the other hand, the hot pack may sometimes be applied injudiciously warm, and thus cause pain, or even damage to the skin by scalding, or it may produce a sense of cold as the temperature falls more nearly to that of the body; but, as in the case of the cold pack, the resulting vapour which envelopes the body will speedily be formed.

In applying the pack, the patient should be completely undressed, or should only wear a thin cotton night-dress, and the wet sheets should be wrapped round and then quickly covered with successive layers of blanket, so as to envelop the patient completely with the exception of the head, care being taken to leave no portion of the damp sheets projecting beyond the blankets. The time spent in the wet pack must, to some extent, vary according to its effects. Twenty minutes or half an hour is usually sufficient to induce copious perspiration, and when the action of the skin has been well started, continued diaphoresis will follow after the removal of the pack. When the sheets are removed the surface should be quickly dried with warm towels, and the patient should be again enveloped in warm blankets.

If, however, there are facilities for employing a warm bath, and if the patient is sufficiently well to be able to remove readily from the bed to the bath and back again, the bath may be used, the water being at a temperature which can be tolerated with comfort by the hand and arm of the nurse; but after the bath it is desirable to promote further diaphoresis by wrapping the patient in warm blankets, directly after he has been quickly dried.

When any one of the foregoing measures is being adopted, free perspiration may be encouraged by allowing the patient to drink copious draughts of water from time to time, while further action may sometimes be encouraged by the administration of full doses of liquor ammonii acetatis. It frequently happens, however, that during the first or even the second employment of any of the above measures, the skin does not act very satisfactorily, and the practitioner must then be guided by his judgment and by observation of the patient as to further treatment. In young adults, when the dropsy is the result of acute nephritis, it is ordinarily advisable to employ hydragogue purgatives, and to repeat the use of the hot bath, or other diaphoretic measure, some twelve or twenty-four hours later. On the other

hand, when the subject affected by renal dropsy is a man of middle age or of advanced years, it will ordinarily be found that if the bath fails to afford immediate relief, it commonly produces much headache, and indeed it may have to be discontinued when the skin does not act, or acts but feebly. Since, however, there are great advantages in the free diaphoretic action of the skin, it is desirable in some cases to endeavour to stimulate diaphoresis by the hypodermic use of pilocarpine. It is sometimes found that relatively small doses of the pilocarpine nitrate will suffice to initiate diaphoresis, which can then be increased by the use of the wet pack or of the hot bath. This drug, however, requires to be employed very cautiously, since although by its use considerable diaphoresis may be produced, it also has the power of promoting excessive action of the salivary glands, and apparently also increased secretion from the bronchial mucous membrane. Therefore it is not to be employed with patients who are so far comatose that they are unable to expectorate, nor should it be used with those who are already suffering from œdema of the lungs, or when there are indications of cardiac weakness.

If diaphoretic measures afford little relief, or if the relief appears to be purchased at the cost of great suffering, it is well to continue the use of hydragogue purgatives, such as the compound jalap powder of the pharmacopœia, or of a mixture of jalap powder with scammony powder; and I have observed that the action of these hydragogue purgatives will frequently be followed by considerable diminution of dropsy, and by gradual increase in the amount of urine that is passed.

In the dropsy of acute nephritis the use of diaphoretic measures is scarcely as imperative as it is in cases of dropsy associated with subacute attacks occurring in the course of chronic nephritis. In acute nephritis, especially in the form resulting from scarlet fever, free purgation is generally followed by rapid diminution of dropsy.

Sometimes, in cases of renal dropsy, the use of mercurial preparations has been advocated, with the view of promoting free purgation, but although mercurial preparations are of great service in selected cases, the selection requires considerable discrimination. In my opinion, it is advisable, as a rule, to defer the use of mercurials until the urine shows signs of improvement, indicated more particularly by a diminution in the amount of blood; the reason of this postponement being that mercurials act not only as purgatives, but also as diuretics, and, for the reasons already given, it is undesirable to employ diuretics so long as free blood is to be found in the urine, since this indicates a condition of active engorgement which can only be increased by the use of stimulant diuretics.

In more chronic cases, however, when the dropsy persists after the urine has regained the customary pale tint characteristic of

chronic kidney mischief, mercurials may be of considerable service. It is indeed in this class of cases that other diuretics may also be used, there being no objection at this time to the use of the alkaline diuretics previously mentioned; as, for example, the acetate or citrate of potassium, or of sodium, which, by their conversion into alkaline carbonates within the body, tend to diminish the acidity of the urine, or even to render it alkaline. These preparations may be used in subacute cases as soon as the urine becomes somewhat more copious and of a lighter tint, while in chronic cases they may be employed throughout the treatment.

Occasionally the risks of suppression are independent of any dropsical effusion, although in general the diminution of the daily excretion of urine bears a definite relation to the increase of the dropsy. In some severe cases of acute nephritis, however, symptoms of suppression may arise before any noticeable dropsical effusion has occurred, while, in cases of chronic nephritis, suppression may ensue in the course of other maladies, or subsequent to operations undertaken for the relief of other diseases. Occasionally symptoms of suppression will rapidly follow the injudicious employment of various drugs, and foremost amongst these must undoubtedly be placed morphine.

In speaking of the use of this drug, at the meeting in Edinburgh, I indicated that my distrust of morphine in connection with renal diseases at that time rested mainly upon the observations of others. Since then I have unfortunately witnessed most serious symptoms after the hypodermic injection of morphine, after a surgical operation on a patient who was already the subject of chronic nephritis. The dose of morphine employed was one which had frequently been used previously in this case with the view of alleviating pain, but after the operation, which was of a formidable character, the same dose apparently sufficed to cause arrest of secretion, with increasing headache and coma, which ultimately proved fatal, in spite of the successful employment of diaphoretic measures.

In some cases of acute nephritis the dropsical effusion may not only affect the subcutaneous tissues, but may also occur in connection with the submucous tissues and with the serous membranes, and in this way very formidable complications may arise, the most serious being that known as œdema of the glottis. With this form of œdema the breathing becomes obstructed, and the difficulty of respiration increases rapidly. As with other obstructive diseases of the larynx, the danger is extreme, and calls for the immediate employment of energetic measures. Relief may sometimes be afforded by scarifying the aryteno-epiglottidean folds, but this operation frequently fails to give permanent relief, and it becomes necessary either to intubate or to perform tracheotomy.

The performance of intubation demands some experience, as well as the possession of the appropriate instruments. Intubation is, however, gaining in favour, and the manual dexterity required is now possessed by many practitioners, who have been led to employ this method of relieving laryngeal obstruction in cases of diphtheria since the introduction of the antitoxin treatment. It must be admitted, however, that both intubation and tracheotomy, although theoretically they should suffice to overcome obstruction of the larynx, which is alone indicated under the term œdema of the glottis, yet may fail to save life, since the œdema is in many cases by no means confined to this region.

In a child recently under my care at the Evelina Hospital, each of these operations was performed in turn. The child was only 3 years of age, and the history of scarlet fever rested on an uncertain basis, the only fact in favour of this hypothetical commencement of the disease being, that one of the boy's sisters was at the same time in another hospital with acute nephritis. The mother had only noticed that the child was unwell three days before it was brought to the hospital, her attention being attracted by finding that the child's face was swollen all over, the eyes being nearly closed. On the following day the swelling became more diffused, the feet and legs being affected. The child appeared to be well nourished, but his face was puffy and pale, and there was general œdema extending over the body, the œdema being greater over the sacral area. On admission, slight impaired resonance at both bases of the lung was noticed, together with some few râles, and the sounds of the heart were somewhat altered. The cardiac impulse was in the nipple line, and the first sound was prolonged. The urine at this time was very scanty in amount, and contained both blood and albumin. A hot bath was given for ten minutes, but did not produce any sudorific action. The following day the dyspnoea increased, and appeared to be laryngeal in origin. There was considerable sucking in of the lower costal margin, and the child's lips were blue and the face pale. Accordingly, intubation was performed, and the immediate result was extremely satisfactory. The child went to sleep quietly, and his distress became much less, although the rate of respiration remained the same as before. The following day the tube was removed, but two and a half hours later the breathing became more and more difficult, and though the intubation tube was replaced, the distress continued. Accordingly, tracheotomy was performed, and although air passed freely through the tracheal opening, the general condition did not improve, and as the difficulty of respiration continued, a hot air bath was used. The skin then commenced acting slightly, but the pulse gradually became weaker, and the breathing more urgent and stridulous. In spite of the hypodermic introduction of ether, brandy, and strychnine, and in spite of the

attempt to relieve the heart by bleeding, the pulse became weaker, and the child died.

Apart from the changes in the kidney, the chief features noticed subsequently were acute œdema of the epiglottis and aryteno-epiglottidean folds, extending thence down the trachea to the smaller bronchi, so that the whole of the lung was dark in colour, heavy and œdematous, and, on division and pressure, exuded considerable blood-stained fluid. In this child, undoubtedly, the œdema extended throughout the air passages, and although intubation and tracheotomy afforded some relief, this relief could not be expected to affect the œdema of the trachea and the finer divisions of the bronchi.

œdema of the lungs is by no means uncommon with renal dropsy, even though there may have been no œdema of the glottis; indeed, in cases of advanced nephritis, œdema of the lung is a more frequent and more formidable complication. The œdema is sometimes replaced by passive effusion into the pleural cavity, so that the physical signs may resemble those of pleuritic effusion, although ordinarily there is no rise of temperature, and but little complaint of pain. These two complications, œdema and hydrothorax, add largely to the risks of renal dropsy, and a third similar complication connected with the pericardium is sometimes superadded.

The treatment of these complications involves some difficulty, since their passive character, to a great extent, hampers the use of those remedies ordinarily employed for similar respiratory or circulatory troubles. Practically, the œdema and hydrothorax must be regarded merely as forms of dropsy which are to be dealt with by diaphoretics, by hydragogue purgatives, and by diuretics, on the same principles which govern the treatment of dropsy of renal origin, while the group of so-called expectorant remedies will be of little or no service. It remains, however, to add that, in dealing with hydrothorax, the question of operative interference will necessarily arise, since it is easy to withdraw fluid from the thorax by means of an aspirator, and the relief which is thus afforded is often immediately apparent.

This mention of operative interference brings me to the consideration of the advisability of early operations in these cases. Certainly in hydrothorax, associated with renal dropsy, there is no advantage in postponing paracentesis, other than the desire to fall in with the natural reluctance of the patient to face any operative measure. But, on the other hand, when a pleuritic effusion, even of passive character, has been allowed to remain any length of time, there can be no doubt that absorption is rendered more difficult by alterations in the vitality of the epithelial lining of the pleural cavity, and also within the capillary walls.

I agree most cordially with the remarks made by Professor

Ewald concerning the desirability of removing this effusion early, and, if necessary, frequently. There is, however, some doubt in my mind whether it is possible to lay down any hard and fast rule as to the right time at which operative measures should be undertaken for the relief of dropsical effusion in the extremities. Certainly, so far as acute cases are concerned, when there is every probability that the capillary walls are intact, I prefer removing fluid, if possible, by medicinal agencies, or by diaphoretic measures, while reserving operative measures either for chronic cases, which show no signs of improvement with diaphoretics and purgatives, or for cases of acute renal dropsy, where the effusion is rapidly increasing and the skin fails to act.

Concerning the operative measures to be adopted, I prefer the employment of several of Southey's tubes, which have previously been rendered aseptic. These tubes may be used, as Ewald recommends, by being passed some distance into the subcutaneous tissues, as nearly as possible parallel to the skin, and their employment is not generally associated with any particular risk. On the other hand, more rapid subsidence of dropsical effusion may be secured, either by acupuncture over the lower extremities, or by making linear incisions over the malleoli. Both of these methods have certainly the advantage of simplicity and rapidity in their favour, but they involve the trouble of collecting the fluid which is poured out, by means of sponges or cloths placed around the limbs, and they also entail the inevitable discomfort of these damp surroundings, which may perhaps favour inflammatory action. It is rare after the use of Southey's tubes to find any indication of inflammation, but it is extremely common for incisions over the ankles, or the performance of acupuncture, to be followed by considerable erythema, or even by some sloughing of the edges of the wound.

Hitherto attention has been directed principally to the relief of dropsy, of hydrothorax, and of œdema of the lung. There is, however, in these cases, great risk of failure of the circulation, independently of dropsical effusion into the pericardium. Such failure, which is indicated by increasing weakness and irregularity of the pulse, has to be combated by the use of stimulants, which should be given by the mouth so long as consciousness is retained, and may be injected subcutaneously when the condition of coma renders swallowing difficult. In extreme cases it will be advisable to stimulate the heart's action still further by the hypodermic injection of strychnine and digitalin.

When increasing dulness over the cardiac region with diminished clearness of the sounds of the heart, indicates that there is much fluid accumulation within the pericardium, paracentesis of the pericardium must be considered. In these cases of passive effusion this operation involves very little risk. I have repeatedly ordered the pericardium to be tapped in children,

without any ill result, even though on more than one occasion the aspirator has obviously entered the ventricle. Certainly, I feel that the risks which follow inaction in such circumstances are greater than those dependent upon operation.

In addition to other measures, some of the immediate risks due to acute nephritis, and also the more remote danger of the establishment of chronic nephritis, must be treated by modifications of diet. These modifications, which are necessary in every case of acute nephritis, whether dropsy is present or not, will be considered more conveniently in the course of a subsequent article. I reserve also, for future consideration, the treatment of the œdema which occurs towards the end of many cases of chronic nephritis, and appears to be dependent upon a gradual development of cardiac weakness. This form of renal dropsy is frequently but little affected by the measures already described.

---

### AN OUTBREAK OF TYPHUS FEVER.

*History*—By HARVEY LITTLEJOHN, M.A., M.B., B.Sc., F.R.C.S.Ed.

*Clinical Features*—By CLAUDE B. KER, M.D., M.R.C.P.Ed.,

*Superintendent, City Fever Hospital, Edinburgh.*

HISTORY.—Murchison in his classical account of the continued fevers makes the remark that a complete history of typhus would be the history of Europe during the last three and a half centuries. With equal truth it may be said that no history of Edinburgh, of its development and of the conditions of life which existed up to a period within the memory of us all, could be written without frequent reference to this disease, which was at one time practically endemic in the Old Town; and annually desolated many homes, not only amongst the poor but also in the ranks of our own profession. Owing, however, to the general increase of trade and the improved social condition of the working classes, which higher and more regular wages produced, as well as to the vast progress which has been made within recent years in all that affects the health of individuals and of communities, epidemics of typhus fever have practically disappeared, and even an outbreak such as we propose to describe must be accounted an exceptional event in the sanitary history of the city.

Accurate information in regard to the prevalence of the disease, previous to the introduction of the Edinburgh Notification Act of 1879, is impossible to obtain, but the following table taken from Murchison gives the number of patients admitted into the Royal Infirmary during ten years, 1862–1871; and when we remember how few of the actual number of cases of the disease could have been treated in that institution, an idea is afforded of how widespread the infection was a quarter of a century ago.