CLINICAL LECTURE

ON

A CASE OF LEAD-POISONING, TREATED WITH IODIDE OF POTASSIUM.

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GENTLEMEN,—George Prosser, a painter, aged 26, four years ago suffered from an attack of lead-colic, accompanied by inability to pass urine, and followed by slight loss of power in the arms and hands. During recovery from the above attack, he was seized with rheumatism and laid up for three months longer. Since that time he has never been thoroughly well. His principal ailments have been night-sweats, free perspiration by day on slight exertion, occasional violent pains in the forehead, frequent nausea after food, and gradual failure of strength in both arms and hands, especially on the right side. Four months before admission into the Middlesex Hospital he left off work, suffered for a while from habitual constipation, and, during the period mentioned, had three distinct attacks of colic. The first was accompanied by loss of power in the arms, which drooped and hung helplessly by his side.

On admission, December 24th, there was marked drooping of both hands at the wrists, at the metacarpophalangeal joints, and at the two succeeding digital articulations. There was considerable wasting of all the muscles in the arm and fore-arm, most pronounced in the extensors and in the ball of the thumb; the deltoids also were deficient in power. There was a broad blue line along the margins of the incisors. No albuminuria was present. He was ordered four grains of iodide of potassium with ten minims of tincture of nux vomica every six hours; compound camphor-liniment to the hands and arms, and sulphur-baths three times a week.

On December 16th, there was occasional inability to pass urine. Faradisation was ordered to be applied to the outer aspects of the arms and fore-arms. On the four following days he complained of pains in the abdomen and forehead. On the 21st, splints were ordered to the inner aspect of the arms and hands, and a pill, containing quinine and iron, was prescribed, in addition to the measures above mentioned.

On December 23rd, we found him with the following symptoms: a feeling of chilliness, nausea, increased pain in the abdomen, severe headache, clammy skin, injected conjunctivæ, epiphora, coryza, and great prostration. The abdomen was tender, especially over the liver and spleen; and there were pains shooting from the knees to the hips. Pulse 132, temperature 101.4 deg.

This was clearly an attack of iodism, and, as I believe, of more than iodism. Iodide of potassium, quinine, and iron, were abandoned, and sulphuric acid substituted. In the afternoon he vomited. On the following day, there was continued pain over the liver and spleen, and ultimately diarrhoea. Compound soap-pill and brandy were administered. On the 25th, the symptoms of fever and irritation, though not abolished, were considerably abated. The temperature had fallen to 98.6 deg., and the pulse to 92. He was ordered lime-water, and five grains of compound soap-pill every six hours. On the 26th, there was decided improvement in every sense. The paralysis of the extensors had greatly diminished; the middle finger and thumb of the left hand and both the wrists were easily extended and flexed. Pulse 80, temperature 98.4 deg.

From this date until the 11th of the following January the patient's condition fluctuated more or less, and many of the old symptoms came and went capriciously. On the whole, however, by this time there was a marked amendment—enough to justify me in recommencing the iodine treatment. From the 1st January he had been taking a sulphuric acid mixture containing quinine and the sulphates of iron and magnesia, along with compound soap-pill, twice daily. I now substituted a pill containing quinine, iron, and opium, and a mixture containing four grains of iodide of potassium with syrup of poppies and mucilage of acacia. There still remained some coryza, epiphora, and shooting pains in various parts; nevertheless, he continued to improve in a desultory way until the 20th January, when he had sharp pains in the abdomen, a feeling of cold in the back, free discharge from the nostrils, and a pustular eruption on the left shoulder and the right side of the face.

Clearly this was a second attack of iodism, and, as I believe, of more than iodism. All medicines were now suspended except the opiate. Again, there was marked amendment in the power of the arms and hands: and now ensued another interval, at the expiration of which it appeared justifiable to begin anew the iodine treatment. On the 30th January, along with the compound soap-pill I prescribed five grains of iodide of potassium three times daily, in association with mucilage

of acacia and infusion of calumba. From this date until February 16th, there was little if anything of moment to notice in his condition. The chief symptoms were some degree of headache, coryza, smarting of the eyes, occasional pains in the abdomen, and indifferent appetite. On the 16th February he felt generally worse than usual; in particular he complained of frontal headache, and in the evening of coryza. On the 17th February occurred another explosive attack, characterised by severe and increasing headache, a pulse of 120, a white, thickly coated, somewhat dry tongue, sickness, sleeplessness, aching in the limbs, colic, prostration, and perspiration. There was, however, no remarkable amount of coryza or suffusion of the eyes. He was ordered an effervescing draught with spirit of chloroform three times daily, and five grains of compound soap-pill every night. The iodide of potassium was omitted. Again, then, followed a marked amelioration in the movements of the hands and fingers.

I now came to the conclusion that I had given quite enough of iodine. From the 22nd of February until his discharge the treatment consisted of tincture of nux vomica, sulphuric acid, a pill containing quinine and iron, sulphur baths, and Faradisation. On the 5th of March he was considered sufficiently well to be sent to the Asylum for Convalescents at Walton.

REMARKS.—You are aware that iodide of potassium has enjoyed for some time past a high reputation for redissolving and eliminating lead from the system—not so much in cases of incipient plumbism as in those where the whole frame is thoroughly saturated with the poison, as in the present case. Two questions at once suggest themselves to your mind. One of the commonest tests for the presence of lead is this self-same iodide of potassium, which throws down, with a lead-compound, a brilliant yellow precipitate of iodide of lead. If, then, iodide of potassium fixes lead in the form of an insoluble iodide—insoluble, I mean, in water and in most solutions—how can it dissolve lead already fixed within the system? The answer is, iodide of potassium not only forms iodide of lead under ordinary circumstances, but it has a strong tendency also to combine with the iodide of lead in the condition of a soluble double iodide of lead and potassium, or plumbiodide of potassium; and the same is presumed to be its operation within the lead-impregnated human system. The second question is this: If the lead is redissolved, ought it not to reproduce, or to exaggerate, the symptoms of lead-poisoning? It *does* reproduce or exaggerate those symptoms, the authorities tell you; but I have never seen the details of this occurrence distinctly recorded. In this point of view it may be useful and instructive to offer a brief commentary on the particulars just enumerated, presenting as they do the strongest probabilities of this very occurrence having taken place.

By way of parenthesis, I may remind you that the alkaline iodides stand in the same relation to mercury as to lead; that this relation is exemplified both in the laboratory of the chemist, and, as the surgeons say, within the human system, where, after a course of mercury, the iodides may reproduce or intensify mercurial action; and that they have been actually administered for the cure of certain forms of mercurialism.

To return to our case. Before admission, within the space of three or four months the patient had three several attacks of colic, for which he was put upon some medicine which, in the end, produced the symptoms of a cold in the head, and was then discontinued. On each occasion he felt the power of the hands and arms considerably strengthened. There can be no reasonable doubt that the medicine he took was one of the alkaline iodides. The same striking amendment occurred after admission under the same treatment on the 26th December, the symptoms of iodism having reached their acme on the 23rd. Symptoms of iodism they unquestionably were for the most part: the question remains, whether they were not something more. I incline myself to the belief that there were additional evidences of lead-poisoning underlying the manifestations of iodism. The severity of the pain and tenderness in the abdomen, and the shooting pains in the limbs and chest, seemed to point in this direction. At all events, I have never seen symptoms so severe in the aggregate as the consequence of a simple course of iodine, nor have I often seen iodism so rapidly culminating. The same symptoms reappeared in a modified form on the 20th January, and immediately afterwards the same amendment followed. Again, on the 17th February, occurred another explosion. This time the characteristic symptoms of iodism were less strongly pronounced, and those of lead-poisoning decidedly in the ascendant. This is a point of considerable importance, and strengthens materially the conclusion which I draw from the foregoing series of events. However unobtrusive the symptoms of iodism in this last explosion, they were plainly predominant in the first two outbreaks which came under our observation. As we then saw at a glance that iodine determined the preceding attacks, so, judging alike from analogy and from the degree of iodism actually present, we infer unhesitatingly that iodine also determined the last event.

On the whole, then, I conclude that in all three instances we produced in this man not iodism alone, but iodo-plumbism, that is, lead-symptoms resuscitated and reinforced by iodine. All three attacks were originated by iodine; two were characterised in the main by iodism, and in a lesser degree by plumbism; one was characterised in the main by plumbism, and in a lesser degree by iodism.

I acknowledge freely that it would be difficult to prove all this—to demonstration, as it is called. The internal pains and other symptoms of lead-poisoning, it must be remembered, never entirely ceased, but persisted more or less throughout, recurring from time to time. It is, indeed, immensely improbable that the symptoms of lead-poisoning in an acute form should by mere accident three several times coincide exactly with an outbreak always determined by iodine, and twice prominently exhibiting the characters of iodism. Nevertheless, some people might say that such a thing is conceivable, and that the events recorded were chance concurrences and nothing more. Again, it must be remembered that iodism in some of its features bears a rather close resemblance to plumbism. We cannot, therefore, as far as the present case goes, absolutely demonstrate that iodo-plumbism, whose existence, theoretically, would seem essential to the principle of the treatment; but assuredly we approach as nearly to an absolute demonstration as clinical experience will ordinarily allow. Anyhow, we can demonstrate iodism, immediately and invariably followed by marked amendment; and that is the main point for all practical purposes. The same practical conclusion is confirmed by the previous history of the case; but inasmuch as this is hearsay evidence only, I have declined to dwell upon it.

It would be unfair to ignore or undervalue the efficacy of the concurrent remedies employed. To these I ought in justice to add that most powerful remedy—time. To all appearance, however, the iodine played the foremost part; the rest were secondary and subordinate.

CLINICAL REMARKS

ON THE

TREATMENT OF NOCTURNAL ENURESIS AND AN ALLIED AFFECTION.

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IN the *Lancet* for November 19th, 1870, Dr. William Thomson, of Peterborough, has recorded two cases of nocturnal incontinence of urine treated successfully by hydrate of chloral. Dr. Thomson's first case was that of a girl, aged 12 years, who enjoyed perfect health, with the exception of wetting her bed every night, and of having a frequent desire to micturate in the daytime. After taking one dose of fifteen grains of hydrate of chloral, the nocturnal symptoms were checked, and, after a fortnight's treatment by the same drug, the day symptoms also disappeared. The second case was that of a boy, aged 13 years, who for seven years had had nocturnal enuresis. This boy was also cured of this distressing malady after taking one dose of the medicine.

A short time after reading Dr. Thomson's note in the *Lancet*, I had an opportunity of putting this drug to the test in this affection. My patient was a girl, aged 15 years, who had wetted her bed every night for nine years. She was ordered fifteen grains of hydrate of chloral every night, and after taking the first dose of the medicine there was no return of the complaint. At the end of six weeks, she had had no relapse of her infirmity.

Being satisfied with the efficacy of this drug in nocturnal enuresis, I next resolved to try its value in a closely allied functional disorder, viz., nocturnal incontinence of semen. In many cases, both of nocturnal incontinence of urine and of semen, there is reason to believe that spasm is an important factor. As you are all aware, the bladder is furnished with two sets of muscular fibres—the detrusor urinæ and the sphincter vesicæ—the latter being the antagonist of the former. In a healthy person, these two sets of muscular fibres counterbalance each other; but under the influence of volition, as when we wish to micturate, the detrusor muscle can overpower the sphincter, which can be controlled by the will. In cases of nocturnal enuresis, the influence of the will on the fibres of the sphincter can, when the person is awake, enable this muscle successfully to oppose the spasmodic contraction of the detrusor urinæ, and thus prevent diurnal enuresis; but when the patient has gone to bed and fallen asleep, this controlling power of the will is lost, and thus the sphincter is unable to counteract the action of the detrusor, and as a consequence of this, the urine escapes from the bladder. In many cases of spermatorrhœa, also, Trousseau was of

opinion that the vesiculæ seminales entered into a state of erection, like the detrusor vesicæ muscle, and that semen was ejected in consequence of this excessive contractility. It is, also, by no means uncommon to find that persons, who are troubled with nocturnal incontinence of urine in boyhood, suffer from nocturnal incontinence of semen when they have arrived at the age of puberty; and occasionally the two affections may co-exist in the same person, as in a case which came recently under my notice.

A gentleman, aged 27, consulted me on February 1st, 1871, for nocturnal emissions and incontinence of urine. He had been troubled with the former for nine years, but had never wetted his bed before the previous night. He found the spermatorrhœa worse when in Cambridge, scarcely ever having passed a night without one or more emissions. He informed me that a brother who died had enuresis when a boy. The patient passed urine in a good stream; his bowels were regular; he had at times severe attacks of neuralgia. His health was completely undermined by the spermatorrhœa; he felt exceedingly feeble, and unable to exert himself either mentally or bodily. He had taken strychnia and other remedies without benefit. I ordered him fifteen grains of hydrate of chloral every night, and recommended him not to drink spirits at night, which he informed me he seldom did. On February 4th, there had been no return of the spermatorrhœa or of the inability to hold his urine during sleep. On February 22nd, my patient said he felt quite well, and had had no return of his complaint, which gratified him very much, as he was shortly to be married.

My next case was somewhat similar to the above, except that there was no difficulty in retaining the urine. The nocturnal emissions also occurred less frequently, and the patient had only been troubled with them for nine or ten months. The result of the treatment by chloral hydrate was quite as satisfactory as in the preceding case; and, as a proof that the medicine was really efficacious, I may state that the patient one evening forgot to take his medicine, and the consequence was that his infirmity returned.

Whenever, therefore, there is reason to believe that nocturnal urinary and seminal incontinence are due to spasm (not the result of irritation reflected from a fissured anus, worms, urinary calculi, congenital phimosis, or of structural disease of the walls of the bladder, etc.), hydrate of chloral will be found a most serviceable drug in their treatment, in consequence of the acknowledged power of this drug of allaying spasm, as observed in tetanus and other spasmodic disorders.

If I were asked what advantages I claim for hydrate of chloral over belladonna in the treatment of these affections, my answer would be: 1. That the effect of belladonna is not so immediate, frequently taking weeks to produce any marked control over the disease; whereas the influence of chloral hydrate is most rapid, the malady frequently disappearing after the first dose of the remedy. This quick improvement cannot be over-estimated in the treatment of these affections, upon which the mind exerts a powerful influence. 2. That belladonna sometimes induces profuse diarrhœa, a result which I have never known chloral hydrate to produce. 3. That belladonna, when pushed to the extent to which it is necessary to be really efficacious, not infrequently impairs vision, etc., which is not the case with chloral hydrate. 4. That belladonna has, in my hands, on several occasions failed to be of any service.

Of course I am aware of the fallacy of the reasoning *post ergo propter*; but, on theoretical grounds alone, I am of opinion that a more extended trial of the chloral hydrate in these affections will establish the therapeutic value which is claimed for it.

There is one other point in connection with nocturnal enuresis which has interested me very much, and that is the close similarity between this affection and epilepsy; indeed, nocturnal enuresis might, without any great error, be called epilepsy of the bladder. I will, therefore, conclude my remarks by stating the points in which I think the analogy holds.

1. Enuresis and epilepsy are both markedly hereditary, and one neurosis may be transformed into the other; patients who have had incontinence of urine in youth sometimes becoming epileptic after puberty.
2. Both affections are influenced by the same system of nerves—the sympathetic, which may, under certain circumstances, induce spasm in the muscular fibres of the small arteries of the brain, as it does in the unstriated muscular fibres of the detrusor vesicæ muscle.
3. Belladonna is of service in the treatment of both these affections, and probably acts by its influence on the sympathetic.
4. Epilepsy may be either essential or due to reflex irritation, and so may nocturnal enuresis.

I have not tried hydrate of chloral as a remedy in epilepsy; but I am of opinion that it will be found useful in the treatment of some forms of this affection.