'Chloroform and ether robbed of their danger' : to the editor of the British Medical Journal.

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"CHLOROFORM AND ETHER ROBBED OF THEIR DANGER."

To the Editor of the BRITISH MEDICAL JOURNAL.

SIR,

The continued reports of death during the administration of chloroform urge me again to endeavour to induce you to draw attention to the easy way of preventing it, advocated in a letter I sent you, and which afterwards appeared in the *Lancet* of October 10, 1891. I again alluded to it in a communication on "Bromide of Ethyl safely administered," "Cocaine given without risk," "A caution against the use of Hyoscine."

Do you refuse to air the subject because the Hyderabad Commissioners, reasoning from theory, not from experimental observation, discountenance the use of drugs that modify the inhibitory action of the vagus, which they consider to be a safeguard against the toxic effect of chloroform? Happily it is rare for an operation to continue long enough to enable the poisonous effect of the anæsthetic to endanger life by acting directly upon the vital centres in the medulla oblongata. The maintenance of too light a state of anæsthesia is the great danger, and all the dangers, except the remote toxic one, are of reflex origin, besides the controlling influence of the higher centres being abolished the reflexes act with greater vigour, being unchecked.

Now the small quantity of atropine, ·001 gramme, and of morphia, ·01 gramme, more or less according to the patient, injected subcutaneously 25 minutes before the administration of the anæsthetic, falls far short of a poisonous dose, but is sufficient to keep in abeyance the inhibitory action of the pneumogastric (? spinal accessory), it also facilitates the narcotic action of the anæsthetic, rendering much less of it necessary, and so greatly minimising even its toxic effect. I have myself used it in numbers of instances, and at all ages, without any untoward consequent.

At Lyons only one death, and that under peculiar circum-

stances, at the termination of a prolonged operation, can I find recorded as due to anæsthetics since the general adoption, some eight years ago, of this prophylactic treatment.

In my opinion, no inexperienced hand should give either chloroform, ether, or bromide of ethyl without having previously protected the patient by means of the said injection, which can be painlessly made near the extremity of and a little posterior to the insertion of the deltoid.

Perhaps these precautionary measures are less needed where care is taken to keep up an *un*interrupted supply of vapour until the reflexes are abolished, and retain them well in abeyance throughout the operation, only letting them appear now and again to avoid a too profound narcosis; that the aspect of the patient and the state of the circulation and respiration are to be primarily considered goes without saying, and the senses of hearing and feeling should be the chief guides in watching the latter, not the advice given by the Hyderabad Commission (Practical Conclusion X.). A short time since I saw a qualified chloroformist carefully keeping the abdomen and lower portion of a patient's chest uncovered in order to watch the breathing, which seemed to be his guide in the administration. This was in Paris, and I heard that the chloroform mortality was one per thousand, in spite of their extreme care to use only the purest chloroform. In Paris the drop method, badly applied, seems general, and consequently the supply of the anæsthetic vapour to be inhaled by the patient is interrupted and varying in strength.

At the General Hospital in Milan, perhaps the largest in the world (3000 beds), where the height and airiness of the wards is in keeping with their palatial size, by the great courtesy of the surgeons, who seemed to take a pleasure in showing and explaining everything, I was enabled to note their method of anæsthetising the patients. Chloroform was exclusively used, and a more or less intermittent supply offered for inhalation, with the usual result that a want is felt for some safer method; I did not discover the precise mortality.

What more striking proof can we have of the beneficial effects of a preparatory injection of atropine; wherever the inhalation goes on in an intermittent manner, there death and endless "narrow escapes" occur, except at Lyons, where the method of administration is precisely similar to that in vogue here, namely,

by means of the little wire and flannel inhaler held over the mouth and nose and the chloroform applied from time to time, but there the vagus cannot act unduly, and the reflexes are not allowed to have free play.

As Scotland is the stronghold of the advocates for chloroform, I will shortly compare the methods used for its administration. In Glasgow the drop system is preached, but rarely applied, that is to say, instead of slightly damping the highest point of a flannel and wire inhaler, and as soon as it is applied over the patient's mouth and nose keeping it moist with a drop a second until the patient is under, and when well under judiciously keeping up the narcosis, I say instead of doing this, a few drops are let fall and then an interval allowed to elapse, and so on, an intermittent supply being offered to the patient, who thus is allowed to breathe, now a strongly now a weakly charged atmosphere, and the time taken to induce anæsthesia much prolonged.

In Edinburgh the chloroform is literally poured along half a foot of a folded towel, which is then gradually approached from the chin over the patient's face; from time to time the towel is removed to receive a fresh supply. In some cases ether alternates with chloroform for a few doses. By this method again the strength of the vapour varies, but the supply is more constant. As a rule, when the patient is put well under with a constant vapour, excitement and vomiting are absent, the heart beats regularly and with sufficient force, the respirations are comparatively deep, and the colour somewhat heightened. When the supply is intermittent and the anæsthesia light all this is reversed: the pulse varies from 150 to 44 beats per minute, the respirations are now hurried and shallow, now barely perceptible, the colour of the cheek pallid, sometimes almost ashy. On several occasions whilst observing the administration, arrested breathing and a pulseless wrist have shown me how near death the individual was.

It would be a happy thing for our patients if we could all persuade ourselves of the extreme danger of arresting the inhalation of an anæsthetic before narcosis is reached. Let those who cannot, try, and believe that Dr. R Kirk's theory is correct, and that the action of chloroform is two-fold—*first*, locally and rapidly upon the lungs where the circulation is retarded; *secondly*, on the general circulation, which latter action is gradual, and only consummated by the time that narcosis is

reached. This secondary action balances the primary, and enables the patient to recover without the danger of any sudden interference with the passage of blood through the heart. Dr. Kirk of Partick likens the arrest of the inhalation of an anæsthetic in the earlier period of its administration, to the sudden removal of a tourniquet from the abdominal aorta.

In concluding, let me briefly warn anæsthetists against attempting to induce narcosis by the introduction of ether vapour into the rectum. The possibility of rectal anæsthesia was mooted by Roux at l'Académie des Sciences, Feb. 1, 1847 (p. 146). Pirogoff in the same year practised it; Simonin of Nancy continued its use two years later. It was then not heard of for some time, but in 1884 a namesake of the great French playwright Molière revived it. These facts I glean from Professor Poncet, who undertook a series of experiments on animals as well as on the human subject, and with an apparatus by means of which the supply and temperature of the vapour were most carefully regulated. He proved that anal anæsthetisation by means of ether is quite possible, but most perilous. The vapour once within the sphincter is beyond control, it passes the illeo cœcal valve, causes distention of the intestine and colic, it liquefies and may continue to enter the circulation after the patient is deeply narcotised. All these dangers past, inflammatory troubles will still have to be contended with. I should have mentioned that rectal anæsthesia is sometimes very long in being induced.

I am, Sir,

Yours obediently,

G. COCKBURN SMITH, M.D.

Glasgow, Dental Hospital.

Nov^{r} 1891