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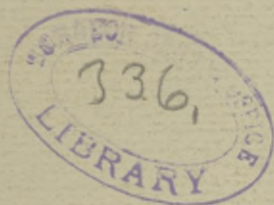
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## NOTE ON THE TREATMENT OF PUERPERAL ECLAMPSIA.

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AN agent that gives promise of improved results in eclampsia is a much-needed acquisition to our therapeutic resources. I venture, therefore, to ask your attention to the value of veratrum viride in the treatment of convulsions and its claims to a wider recognition.

Its use for this purpose has been known to the profession for several years,<sup>1</sup> but it has not yet received the attention which its importance deserves. This has been due in part to the fact that dangerous properties have been imputed to the drug by certain authorities, though unjustly, partly, no doubt, to the use of faulty preparations or faulty methods of administration by many practitioners who have given it a trial. No satisfactory conclusions can be drawn from its use by the stomach in eclamptic patients, owing to the uncertainty with reference to the amount retained and absorbed. I shall hope to show that the use of a reliable preparation of the veratrum viride is not only a safe, but, when given subcutaneously, a prompt and efficient means of controlling the convulsive paroxysms.

As regards the physiological action of veratrum, its most

<sup>1</sup> The credit of first calling attention to the use of veratrum in the treatment of eclampsia is due to Dr. Herbert Fearn, of Brooklyn, N. Y. *Am. Jour. Obstet.*, 1871, p. 28. "Veratrum in Large Doses as a Substitute for Blood Letting in Puerperal Convulsions."

Prof. Fordyce Barker has been for many years a well-known advocate of the utility of veratrum viride in this and other therapeutic applications.

*presented by the author.*



remarkable property is its power to reduce the frequency and force of the heart's action and to diminish the arterial tension. Dr. E. R. Squibb discusses the physiological action and properties of veratrum in an instructive paper to be found in the *Ephemeris* for October, 1887. Alluding to the potency of veratrum as an arterial sedative, he cites the experiments of Prof. H. C. Wood with its alkaloids.<sup>1</sup>

"The carotid and subsequently the femoral artery of a dog were cut while under the influence of the alkaloids. The bleeding in both instances ceased spontaneously. The force of the circulation had been so greatly lessened by the alkaloids that there was spontaneous arrest of hemorrhage without dangerous loss of blood."

The value of veratrum in eclampsia appears to depend on its effect upon the vaso-motor tonus. According to Percy, quoted by Peugnet (*N. Y. M. R.*, 1872, p. 121), it is conveyed by the blood into the vasa vasorum, and through them paralyzes the vaso-motor nerves, the blood-vessels thus losing their contractile power. It thus relieves the vaso-motor spasm of the cerebral vessels, and the consequent cerebral anæmia to which the convulsions are believed to be due. It is also a spinal-motor depressant, though probably, as suggested by Peugnet, this effect is secondary to its action on the sympathetic through the vaso-motor nerves.<sup>2</sup>

In excessive doses, veratrum causes a profound collapse; in lethal doses, it is believed to act as a cardiac poison. It is never necessary to push the drug to a dangerous degree, however, in eclampsia. Vomiting, pallor, and a sense of exhaustion are sometimes encountered from large medicinal doses, but these symptoms are soon relieved and are never followed by ill results. The writer has witnessed alarming prostration, simulating impending death, from the use of

<sup>1</sup> "A Contribution to the Knowledge of the Physiological Action of the Alkaloids Viridia, Veratroidia, and Veratrum of Commerce and of the Resin of the Veratrum Viride," H. C. Wood, M. D., *Am. Jour. Med. Sci.*, N. S., vol. lix, p. 36.

<sup>2</sup> According to Prof. J. A. McCorkle, the drug by overcoming the vaso-motor spasm of the renal vessels exerts a favorable effect also as a diuretic.

veratrum in children for post-scarlatinal convulsions. The patients, however, rallied promptly under moderate doses of alcohol and morphia, and no injurious effects remained. A careful search of the literature of the subject fails to discover a case of veratrum death from its use in convulsions. Peugnet states that he has found but a single recorded fatal case from its use in any class of cases, that of a feeble child, aged one year and six months, to whom thirty-five drops of the tincture had been given in divided doses.

Dangerous symptoms, however, are said to supervene upon assuming the erect position while under the influence of full doses of veratrum. It is important, therefore, that the patient be kept in a recumbent posture during the treatment.

Dr. Squibb recommends as the best preparation the fluid extract made from the rhizome of the plant. The rootlets he rejects as unreliable. The proprietary article known as "Norwood's tincture is of about half the strength of Squibb's fluid extract," but is probably not equally reliable. From the researches of Bullock and Wood, the alkaloids appear to possess no advantage over the whole drug. These conclusions are confirmed by Peugnet. The European plant, or veratrum album, can not replace the veratrum viride, or American hellebore, for our purpose. The former contains a principle not found in the American plant, by reason of which it produces in large doses an inflammation of the alimentary mucous membrane. It is also otherwise inferior. The preparation almost invariably used in my practice has been the fluid extract of the green hellebore of Squibb.

As regards the mode of administration, the stomach of the eclamptic patient should not be trusted for the absorption of the drug. The only reliable method of bringing the circulation rapidly under its influence is by the hypodermic syringe. Prompt effects and precision of dosage in this class of cases are generally impossible by the stomach. Some irritation at the seat of puncture follows the hypodermic use of the fluid extract, but with a clean needle supuration never results.

The average dose should be from ten to twenty minims. The smaller dose repeated in a half-hour will doubtless suffice in the majority of cases. Yet I have usually preferred to place the patient at once fully under the influence of the drug. The guide to the dosage is the frequency of the pulse. Experience seems to justify the statement that no convulsion will occur while the patient is sufficiently under veratrum to hold the cardiac pulsations below sixty to the minute. The average time required to develop the full effects of a single subcutaneous injection is thirty minutes. If the desired result is not attained after that interval, the injection should be repeated in the same or smaller amount, as may be required. Five-minim doses at longer intervals will suffice to maintain the diminished pulse-rate. I have rarely repeated the drug, however, after the circulation has been once brought profoundly under its effects, the total dosage seldom exceeding twenty to thirty minims of the fluid extract.<sup>1</sup>

My experience with veratrum in eclampsia comprises twenty-two cases, most of them seen in consultation. Sixteen were women pregnant for the first time. In twenty-one cases, the first convulsion occurred before or during the first stage of labor. In one, the first attack was post partum. In sixteen, the labor was complicated with the use of forceps or version, twelve of the operated cases being primiparæ. It will be granted that these were not of the most favorable class of eclampsic patients. In the whole number, there were six deaths, three by complications and three by eclampsia. One of the cases dying by convulsions was complicated with edema of the lungs. The mortality from all causes was therefore 27·2 per cent., 13·6 per cent. dying by eclampsia. Of the deaths by complications, one (that of the patient

<sup>1</sup> Much larger doses have been used with impunity by other observers. In a desperate case of puerperal eclampsia, reported to the Med. Soc. Co. Kings several years ago by Prof. E. S. Bunker, M. D., four hundred minims of Squibb's fluid extract of veratrum viride were administered by hypodermic injection during the first six hours of the treatment. Diminishing doses were continued for many hours longer. The patient made a good recovery.

whose first convulsion was post partum) was due to pulmonary edema, two to septicemia. In each of the three cases dying by eclampsia, from twenty-four to thirty or more convulsions had occurred before the veratrum treatment was begun. If it be granted that the latter three cases were practically hopeless before treatment, and that the two septic deaths were preventable deaths, these results may be taken as affording some evidence of the value of the treatment. In the majority of cases, however, other measures were also used. Chloroform was given to gain time for the action of veratrum, and hydragogues were more or less freely used in most instances as a supplementary measure.

But we need not base our estimate of veratrum on these results alone. The capabilities of the drug are more conclusively shown by the unfailing certainty with which in my hands it has arrested the convulsive paroxysms, when given early. In all except the three cases fatal by eclampsia, the veratrum treatment was commenced before the eighth convulsion. In none, with a single exception, did a paroxysm occur after the treatment was established. This patient had already had no less than thirty convulsions, the pulse was 172, and the woman nearly moribund. Sixty minims of the fluid extract in three doses reduced the pulse to only 100. The paroxysms continued, and the patient died within two hours. With this exception, the pulse fell in every case below sixty within a period varying from 12 to 45 minutes, after the full hypodermic dose. In no case was there a convulsion while the circulation was sufficiently under the influence of the drug to hold the pulse at sixty or lower. This experience, then, seems to show that in veratrum if given early we have a well-nigh certain means of controlling eclamptic convulsions.

As regards the safety of the drug, I may say that in no instance has a dangerous prostration been noted. The most unpleasant effects experienced have been temporary nausea and depression. Even these symptoms have been transient, passing off in a few hours.

One of the above-mentioned cases is of especial interest, as going to show the possibility of long-continued use of veratrum without harmful results. The patient was a primipara in the sixth month of gestation. She was seized with a convulsion, directly after which the urine was found loaded with albumen, turning solid with heat and nitric acid. The treatment was chloroform and the bromides. Two days later she had a second convulsion. I was then asked to see her. She was at that time partially unconscious and delirious. Our first proposal to interfere with a view to terminate the pregnancy was abandoned owing to the religious scruples of the friends, the family being Catholics. Twenty minims of the fluid extract of veratrum were given in two doses by the mouth. Her physician informs me that the patient continued to take this preparation in doses of six drops, three times daily for three weeks, when she was delivered. The drug was continued in diminishing doses for a week longer.

The patient steadily improved under the treatment, had no further convulsions, and recovered rapidly after delivery. The customary measures were used for the treatment of the nephritis.

To recapitulate, the advantages claimed for veratrum, when used in accordance with the plan above described, are briefly these:

1. It is at once a harmless and an extremely potent measure.

2. It is eminently a manageable agent, the pulse affording a ready and precise guide to the dosage.

3. It is prompt in its action, and easy of administration.

In conclusion, it should be noted that veratrum is not advocated as an exclusive reliance in the treatment of convulsions.

Chloroform by inhalation, as the most prompt of all anti-eclamptic measures, should be given till the circulation has been brought fully under the influence of veratrum.<sup>1</sup> Dur-

<sup>1</sup> Further experience in the use of veratrum in puerperal convulsions will be found in a recent [paper by Dr. I. E. Oatman, San Francisco, Cal., *Proceedings*



ing operations its use as practised in other artificial deliveries will be an additional safeguard against convulsions.

Cathartics will be of great service to reinforce and supplement the treatment.

The acceleration of the labor by judicious means and the induction of labor, when not spontaneously established, are always indicated on the occurrence of eclampsia.

*Int. Med. Cong.*, 1887; and another by Prof. J. D. Rushmore, M. D., Brooklyn, N. Y., on the use of veratrum viride in Kings Co., N. Y., with special reference to its control of puerperal convulsions. *Gaillard's Med. Jour.*, November, 1887.





