THE TREATMENT OF CHOREA WITH TYPHOID SHOCK

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Until recent years, it was doubtful whether any type of medical therapy had shortened the course of Sydenham's chorea. Standard medication consisted of prescriptions containing salicylates or some form of arsenic. Inasmuch as the disease usually subsided spontaneously in one to three months, medication probably influenced its course very little.

With the advent of nonspecific fever therapy, we now have a method of treatment which not only shortens the duration of the disease, but also prevents, to some extent, the onset of endocarditis and arthritis if it has not already appeared.

Many authors have advocated passive methods of raising the body temperature, such as the heat cabinet or the induction coil[1,2]. Like another group of investigators[3,4], we have employed intravenous typhoid and paratyphoid vaccine with the idea that active participation of the body cells in producing the rise of temperature resembles an active immunity, and that it is more likely to be effective at lower temperatures. We are listing in the order of importance some of the reasons for believing that our method of inducing hyperpyrexia by intravenous typhoid vaccine is especially worthwhile.

1. Safety — we have never had any serious reactions or complications in any case in which we have used this method of typhoid shock, regardless of the patient's age.

2. Comfort — patients do not complain of undue discomfort during the chill or secondary fever following the injection.

3. Control of fever — with the use of a modification of the method of Howard[5], we have not observed excessively high fever.

4. Economy — although the usual course of six febrile reactions requires a period of two weeks in the hospital, we have been able to discharge an occasional patient after two or three chills. At times, relief of symptoms has been marked after the first chill.

5. Convenience — although it is better to carry out treatment in the hospital, there is no good reason why the injections could not be given in the home under the direction of an intelligent mother.

The equipment needed is simple, and includes any standard preparation of typhoid and paratyphoid A and B vaccine, a 10 cc. luer syringe with needle, sterile normal saline in ampoules or freshly prepared, and a thermometer.

Our modification of Howard's method is as follows: The initial dose is 25 million for adults and 15 million for children under ten years. The bacteria are diluted in about 10 cc. of sterile physiological saline and given in the vein of the forearm. In one to three hours the patient has a chill followed by fever to 102.5 or 103° F. If a chill does not occur, the vaccine may have been administered extravenously unintentionally.

With the prompt rise of temperature, the patient has no feeling of depression, but rather the sensation of getting a slight "cold". Within two or three hours, the fever may drop rapidly or be followed by a secondary rise. As soon as the temperature remains fairly normal for 24 hours, the second dose of 50 million bacteria is given. Each subsequent dose is double the preceding dose until a total of six injections have been given. In other words the patient receives successively 25 million, 50 million, 100 million, 200 million, 400 million, and 800 million bacteria. We always allow an afebrile period of approximately 24 hours to elapse before giving the next dose.

Although we select our patients with some care, we find, as have others, that acute arthritis, myocarditis, or endocarditis do not increase the hazard of treatment. As a rule the swollen joints subside and pain is alleviated although this improvement is not always permanent. However, rarely is there a recurrence of the chorea after a full course of protein shock has been given.

We assume that the effect of nonspecific protein shock is twofold. First, the elevation of temperature in itself may have an unfavorable effect upon the causative agent, be it a virus or bacterium. Second, the cellular reaction of the tissues to the foreign protein may bring out several effects which contribute to the active defense of the body to the disease, such as increased capillary circulation, increased cellular oxidation, increased permeability of the cell membrane, increased exudation of serum from the capillaries, increased enzymes and antibodies, and leukocytosis accompanied by an increase in phagocytes.

It is reasonable to assume that such cellular and enzymic responses are more pronounced when the fever is produced by nonspecific shock methods than by the use of the heat cabinet, and yet there is no proof that such is the case. The favorable reports by Barnacle, Ewalt and Ebaugh[1] and by Kendell and Simpson[2] with the use of the Kittering hypertherm would lead us to believe that this is an effective method for the treatment of Sydenham's chorea. As fully as good results follow the use of intravenous typhoid vaccine, and as this method of therapy has been entirely safe in our hands as well as simple of operation, we believe that it can be employed by the average practitioner with the assurance that in the majority of instances he can bring prompt relief to his patient suffering with chorea.

A summary of the important points in 17 cases of chorea treated in the hospital is shown in Table 1. Most of the patients required the full course of six chills, although a few recovered after three to five reactions. In all but two patients, immediate recovery or decided improvement was noted while under hospital observation. One patient, a girl of 16 years, seemed to be worse during her treatments but recovered within a week after returning home and was well eight and a half months later. Her recovery occurred three weeks after the onset of the chorea and may have been a spontaneous cure.

TABLE 1

No.	Age	Sex	Rheum.	Tonsils Out	Duration Chorea	Grade	Previous Attacks	Heart Murmur	Immediate Results	Late Results
1	12	F	6 attacks	+	2 months	+	0	0	Recovered	Well, 4 months
2	16	F	1 attack	0	½ month	+++	0	0	Poor	Well, 8½ months
3	17	F	1 attack	+	1 month	+	0	+	Recovered	Well, 31 months
4	25	F	1 attack	+	2 years	++	9 attacks in 2 years	0	Improved	Well, 5 years
5	13	F	?	+	6 days	+++	0	0	Recovered	Well, 8½ years
6	15	F	0	+	7 years	++	++	0	Improved	No improvement 10 years in State Hospital
7	17	F	?	?	1½ months	++	0	0	Recovered	No report, 11 years
8	7	F	0	0	2 months	+	0	0	Recovered	No report
9	13	F	0	+	5 months	++	2	0	Recovered	Well, 10½ years
10	15	F	1 attack	+	3 weeks	+	0	0	Recovered	Well, 2 months
11	10	F	0	+	2 weeks	+++	0	0	Recovered	Well, 2 months
12	16	M	1 attack	0	3½ weeks	++	0	0	Recovered	Well, 5 weeks
13	17	M	?	0	1 week	+	0	0	Recovered	Well, 2⅓ years
14	11	M	0	+	1 month	++	0	+	Recovered	Well, 2⅙ years
15	11	M	0	+	6 weeks	++	1	+	Improved	Well, 3 years
16	12	M	0	+	1 month	+++	1	0	Recovered	Well, 1½ years
17	14	M	+	+	?	++	1	+	Recovered	No improvement

Another patient (Case 6) who improved markedly in the hospital became worse upon returning home, and the ten year follow-up revealed that she is in a hospital for the insane. Although the case history does not record a family history of chorea, it is likely that she had Huntington's rather than Sydenham's chorea. One patient had two or three subsequent attacks of chorea, but is now well (Case 4).

Tonsillectomy had been performed in 12, or 80 per cent, of the cases previous to the attack of chorea. Obviously this procedure was not effective as a prophylactic measure. Previous rheumatism was recorded in 7, or 41 per cent, and of these two had an endocardial murmur. The other two cases of endocarditis gave no rheumatic history.

The sedimentation rate was estimated in 11 cases, and was high in only 4 cases, two of which showed an endocardial murmur. There was

no anemia in any instance, a slight leukocytosis in only 3, and a fever in 3 with a maximum of 100.8° F. From this data one might assume that all of the cases were mild and that the results might have been different in severe chorea. The records show that the majority of patients were very active cases although none were disturbed by muscular jactitations during sleep. Likewise, good therapeutic results were just as prompt in the severe as in the milder cases.

COMMENT

Even though Sydenham's chorea is usually a self-limited disease, we believe that it is worthwhile to terminate the disease as rapidly as possible. While there is no assurance that typhoid shock therapy will prevent a recurrence or guard against a subsequent attack of rheumatic fever or endocarditis, yet in our short series this has been the case in 80 per cent. Furthermore, the gratitude of the parents of these children, as well as the comfort of the patient, are factors that justify the use of this harmless therapy. We advocate the method of Howard since it has been found to be safe in our treatment of many hundreds of patients with various diseases. It works well in both old and young and there are few contraindications for its use. In severe cardiovascular renal disease, severe diabetes or advanced arteriosclerosis, any type of nonspecific shock treatment probably should be avoided. In children, however, the reactions cause little discomfort.

CONCLUSIONS

In a series of 17 cases of chorea, 16 of which had Sydenham's chorea, the results were satisfactory both early and late in 80 per cent. Typhoid shock therapy for this disease is simple, safe and economical. The results are gratifying.

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