

## Iodine

### Its Use in the Treatment and Prevention of Poliomyelitis and Allied Diseases

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According to British Law, an individual is innocent until proven guilty. Applying the same legal dictum to Poliomyelitis its cause was adjudged, between 1905 and 1911, to be contagious and infectious; this, in the absence of a knowledge of its cause of spread, its only proven crime being that it could become epidemic. It was declared to be viral in origin.

This implication by the Public Health Laws of many of the Provinces of Canada and of the States of the Union made Poliomyelitis legally an infectious contagious disease, and thereby opened the door for research, considering the disease as such; and closed the door to research along lines other than that which has been publicised and financed by endowment in the past forty years. This situation finds the Medical Profession in this year of our Lord 1954 in a position to declare "We have no treatment for Poliomyelitis." Truly nursing care has improved, dating from the initiation of the Kenny Method of therapy, but methods of treatment or prevention of the disease are conspicuous by their absence.

Viewing the disease from a Clinical stand point, in Manitoba's Epidemics of 1952 and 1953 one notes that:

1. Few of our cases had a history of contact with an earlier case.
2. Few of our cases transmitted the disease to family contacts.
3. Few of Medical Personnel in attendance upon Polio patients acquired the disease or transmitted it to their families.
4. A state of fatigue frequently preceded the attack, yet many Medical Personnel working with these patients to a point of their exhaustion did not fall victim to the disease.
5. The disease is seasonal and may be Geographical.

Animal experimentation has truly shown the disease to be transmissible, but no single means of transmission in the human animal has been proven.

The fact that Polio is a Seasonal disease occurring in late Spring and Summer, places it in a class apart from practically all other infectious diseases, which are most prevalent in those Seasons when humans are confined within doors and congregate in groups. And the fact that epidemics fall off with the advent of cool fall days and nights, leaves one to consider if the then existing protection is not linked with body function; probably with stimulation of Thyroid function.

An overall Geographic picture of epidemics would place Winnipeg as the Canadian Polio capital and St. Louis the American capital. A similar map drawn for Encephalitis in horses would correspond favourably with the polio map.

Viewing the problem of spread from the Geographic angle one is not a little surprised to see it compares favourably with our Goitre area. Could Iodine deficiency link in with Polio's so called infection?

Assuming this to be a fact and after confirming the assumption in animal virus diseases, in 1952 I treated three Bulbar Polio patients with intravenous Sodium Iodid. In these three, control of the disease was found to be most rapid and convalescence surprisingly brief. I was, at this time, convinced that the Iodides acted as a virucide, but the virucide theory was hardly tenable as the quantities used (grs. 7½) was hardly ample and the dosage was never given more than twice, and then three days apart. Further consideration and discussion brought forth from one of my confreres the suggestion that by the intravenous injection of Iodides I was stimulating a defense mechanism, the Iodides acting as a catalyst.

The 1953 epidemic was entered with this theory in mind. Numbers, and the varying severity of the disease, forbade intravenous therapy so I administered iodides orally depending on clinical examination for diagnosis, I having concluded in 1952 that spinal puncture only added insult to injury, with nothing gained.

The season advanced; Gamma Globulin stocks became exhausted; and my patients clamored for protection. Carrying the defence mechanism theory a step farther; "if I could control why could I not protect?" Of those seeking protection I formed an experimental group, giving one to three minims, according to age, of S.S. Pot. Iodide in milk daily for ten days (equivalent to 1.7 to 5 grains K1).

The season finally ended. I had seen some sixty cases. Two were sent to the King George Municipal Hospital because of the possibility of respiratory difficulties and lack of nursing care. The remainder were treated at home. Only one on home care developed paralysis, a paralysis that did not advance after oral Iodide administration. None of two hundred contacts on prophylactic therapy developed Polio. There were no deaths.

Can this theory fit our endemic cases and our Eskimo group? I believe it may. These people may be so low in iodine requirement as to have

little or no defence against the invader if such there be.

The use of iodides in the control of known virus diseases affecting the central nervous system is by no means new.

1. Manson, of England (1825) advocated its use in Palsies, many of which cases must have been Polio.

2. Coplan (1850) reports benefits in Palsy, derived from Potassium Iodide in dosages as small as grs. 1 in twenty-four hours.

3. Brown-Sequard (1861) recommended Potassium Iodide as the only known remedy that could be used without danger in various forms of Paraplegia.

4. Sinkler (1875) reported the treatment of an asthmatic with Potassium Iodide. The patient, who also had Polio, improved with the therapy.

5. Elliott (1885) employed and recommended Potassium Iodide in combination with other medications in Polio. Similar therapy was employed by Erb, Charcot and Hammond.

6. Webber in (1885) recommended its use in Polio.

7. Ridley (1925) employed Tincture of Iodine in the treatment of Beriberi, a paralytic disease genetically related, according to 8. Braddon, to poliomyelitis. Beriberi was at one time declared like Pellagra to be a virus disease.

9. Sir Thomas Horder (1927) reported the use of Colloidal Iodine intravenously in the treatment of Poliomyelitis. He recommended its early use.

10. Breuil and Dartiguenave (1937) after trial with chemo-therapy failed in Polio, reported improvement on iodine therapy.

11. Maberly (1939) reported complete recovery of four cases of Polio on iodine therapy.

12. Mazzitelli (1939) gave a teaspoon of iodine-tannic acid syrup twice a day for several days to children in families with cases of Poliomyelitis or in contact with them. None of these children who had preventive therapy developed poliomyelitis in that epidemic or in future ones. (Syrup Iodo-Tannicus contains (1.0%) Iodine).

13. Scoby (1946) suggested the use of Iodine in the prevention and treatment of Polio and 14. in (1948 pointed out that iodine combined with ascorbic acid and calcium produced improvement in some cases in twenty-four hours.

The present writer in 1944 discussed with Dr. Fahrni of Winnipeg the possibilities of using intravenous Sodium Iodide in Polio. Dr. Fahrni was then using Sodium Iodide, grs. 15, in 10 cc. distilled water (Park-Davis) intravenously in Thyroid Crisis. Dr. Fahrni assured me that if given slowly it could at least do no harm. Not until 1952 did the opportunity arise to use it, with the previously recorded results.

15. In 1948 I reported to the Canadian Medical Association Journal a report of a number of experiments with Iodine on humans and animals.

#### Iodine Therapy in Herpes Zoster

16. Head and Campbell (1900) described Herpes Zoster as "Acute Posterior Horn Poliomyelitis." In this disease the anterior horn cells have not infrequently been involved and paralytic manifestations and atrophy have been observed. Epidemics of Herpes Zoster have been reported. These epidemics have sometimes paralleled Polio epidemics.

17. Ruggles (1931) and 18. Beers (1939) reported early and dramatic relief of Herpes Zoster with intravenous Sodium Iodide.

19. Beckman (1953) approves the use of Sodium Iodide, Gms. 2 in 30 cc. of water intravenously at two day intervals for four or five treatments in Herpes Zoster.

#### Iodine in the Treatment of Encephalitis and Central Nervous System Diseases of Animals and Fowl

20. Lewitis (1935) states that Iodides have been used with surprising results in cases of inflammation involving the spinal cord and brain.

21. Brinton, a poultry man (1931) reported that leg weakness in his flock following the feeding of excess wheat was cured with iodized buttermilk. Later he prevented the leg weakness and also Coccidiosis with said buttermilk.

22. Grey (1940) used a 10% solution of potassium iodide in distilled water in the treatment of fowl paralysis (lymphomatosis). After the first injection the birds became brighter, after the second muscular tone was restored and the birds rapidly progressed to normal.

23. Radeleff (1946) employed intravenous sodium iodide in the treatment of equine encephalitis. In his group so treated the mortality rate was less than 10% with no "dummies." Dummies are animals that survive, but have permanent brain damage. In his control group the mortality rate was 40 to 50%. He reports rapid recovery and short convalescence in his iodide treated group.

McLoughry, a Manitoban Veterinarian, during the epidemic of encephalitis in the later thirties and early forties paralleled Radeleff's findings. He employed potassium iodide. His success prompted my experiment reported in 1948 in the prophylaxis of equine encephalitis.

It is worthy of note that a number of workers including 24. von Economo (1931) employed iodine in the treatment of human encephalitis with favourable results.

Last Summer Dr. Archie Kiteley of Nipawin, Sask., drew my attention to the fact that his area had no cases of human encephalitis during or since the epidemic years. This he argues may be due

to the fact that in the early days, while we farmers were battling our stock breeding problems, he and his confrere, Dr. Max Scott, recognizing the deficiency of iodides, prescribed sodium iodide in practically every prescription they wrote. Is it possible epidemics of Polio were suppressed by this very means?

25. In an editorial in the Journal of the American Veterinary Association the reports on the treatment and prophylaxis of equine encephalitis by Radeleff and myself are reviewed. In that editorial it is pointed out that 26. Holtman (1946) has made known his belief that there may be a relationship between the level of thyroid secretion and susceptibility to human poliomyelitis and encephalitis, due to the fact that these diseases occur in warm weather when natural secretions of the thyroid are the lowest.

Within our midst we may shortly have definite information to prove or disprove Holtman's belief. Dr. Brereton, Sr. is finding some startling data on thyroid function in children. And Dr. Elliott is conducting a survey in those areas of Manitoba which the Dept. of Health supplies with Iodides to prevent Goitre, to determine the incidence of Polio in those children on iodides.

#### Comment

A summary is here presented of the uses of Iodine in treating Poliomyelitis and other central nervous system fevers in man, animals and birds. Its use in Polio is viewed with definite doubt by a large portion of the Medical Profession and this with reason, for so many theories of therapy have failed, even our hopeful Gamma Globulin being questioned, not without reason.

My personal opinion is that Iodine restores to normal a function probably thyroid in origin, which produces a chain reaction of defence and the patient is made to develop his own Gamma Globulin or its counterpart. I do not ask you to accept my theory without reserve until I have delivered further proof. I am planning, should Manitoba have a Polio epidemic in 1954, to place an experimental group of 10,000 on prophylactic therapy. May I ask your sympathetic observation and your extension of the experiment if you see fit.

I am in my own mind convinced that Iodine constitutes a prophylactic means against Polio; that its use in the treatment of Polio tends to restore muscle tone early and reduces convalescence to a minimum. Its use as a prophylactic could be extended to large areas by using the present system employed by Provincial Health in Goitre areas. This would bring the third Halogen, Iodine, into the field of Preventive Medicine with Chlorine and Fluorine.

#### Appreciations

27. To Dr. R. R. Scobey, 1411 South Salina St., Syracuse, N.Y., I extend my appreciation. I have used his article in the Archives of Pediatrics, 68, 1951, as my guide in tracing the Medical uses of Iodides in human therapy. I have indulged possibly in plagiarism in my quotations from his article. My only regret is that he does not quote his own cases. He may have been in a position not dissimilar to my own from 1944 to 1952 when I had no cases.

To Dr. Isa, of the Veterinary Department of the University of Manitoba, I am indebted for research of Veterinary Medical Literature.

To Dr. Ormerod of the Manitoba School of Medicine, I am indebted for discussion and constructive criticism. He is responsible for the formulation of the protective mechanism theory.

To my best of all wives I am indebted for her patience in reviewing my records and assisting in my experiments. Her observations were most valuable.

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