

# Massive Doses of Vitamin C In the Treatment of Viral Diseases

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TREATMENT OF VIRAL DISEASES presents to the physician a perplexing and frequently unrewarding problem, particularly since some 50 different diseases of man are of viral etiology. To date no generally effective therapeutic measures have been devised for treating viral diseases, although some diseases caused by the largest of the known viruses appear to be affected by some chemotherapeutic agents. Therapy with specific antisera is useful as a preventive measure during the incubation period of some viral diseases, but is generally of little value once clinical manifestations of the infection have ensued.<sup>1</sup> Therefore, an effective therapeutic agent that would substantially reduce the morbidity of the majority of viremias would provide the physician with a most valuable adjunct to treatment.

There have been a number of reports in the literature suggesting that infectious disease processes rapidly accelerate vitamin C depletion and greatly increase vitamin C requirement." The role of vitamin C in maintaining stability and tensile strength of connective tissue is well known. This property favors, among other things, the building of a protective barrier against infectious invasion.<sup>4</sup> When ascorbic acid stores are severely depleted during the course of infectious diseases, capillary resistance decreases and susceptibility to the action of certain toxins appears to increase.<sup>2</sup> It has been suggested that means of altering the susceptibility of cells to invasion by viruses could provide a method of controlling as well as preventing infection.<sup>7</sup>

Several investigators have reported employing massive parenteral doses of ascorbic acid in the adjunctive treatment of viral diseases. Klenner<sup>3</sup> has advocated and employed massive doses of intravenous ascor-

bic acid for many years in the treatment of various viral diseases including measles, mumps, chickenpox, viral pneumonia and viral encephalitis, and has reported remarkable results. Even with doses as high as 65 mg./Kg. Klenner rarely encountered any adverse effects and those were limited to the site of injection. Klenner has administered chemotherapeutic agents along with ascorbic acid to reduce secondary bacterial infection and has recommended the subsequent use of Vitamin B1 following infectious diseases involving the nervous system. He further theorizes that the near absence of ascorbic acid in infectious states may be attributed to the vitamin combining with the toxin and/or virus to form a new complex which is easily destroyed by oxidation.

### Free from Reaction

McCormick<sup>4</sup> administered ascorbic acid intravenously or intramuscularly in massive repeated doses, 500 to 1000 mg. every four hours. He reported that this approach exhibited a potent chemotherapeutic-like action in acute infectious processes which compared favorably to that of the sulfonamides or antibiotics but with the advantage of complete freedom from toxic or allergic reactions. Baur and Staub<sup>5</sup> reported highly satisfactory results were obtained with daily intravenous infusions of 10 gm. of ascorbic acid in 1000 cc. of isotonic saline solution administered for an average of five days to patients with infectious hepatitis. They have described the action of ascorbic acid as "virucidal." Calleja and Brooks<sup>6</sup> reported that daily intravenous infusion of 5 gms. of ascorbic acid for 24 days resulted in remarkable improvement in a patient with acute hepatitis when other therapeutic measures had proved futile.

Reports from German literature show

that high doses of vitamin C are beneficial in epidemic hepatitis in children. These beneficial effects were clearly observed in 63 cases of epidemic hepatitis treated with high doses of vitamin C in doses of 10 gms. daily for an average of five days given either by rectal infusion or intravenously, or both.<sup>9</sup>

This investigator evaluated a product trademarked Viron-1\* as an adjunct in the treatment of a series of cases involving diseases of probable viral etiology. Viron is a preparation for intravenous administration consisting of 2000 mg. of ascorbic acid per dose fortified with certain B-vitamins. I was primarily concerned with patient response to this mode of therapy since time of recovery was of major economic importance to these patients. It has been my past experience that the more intense the patient's symptoms the greater the morbidity and the longer the convalescent period.

The following case histories are representative of this therapeutic regime:

#### **Infectious Hepatitis**

A 20-year-old white female hospital medical technician was first seen for the present illness on Nov. 9, 1959. The illness dates back to the spring of 1959 when she began to feel progressively weaker, exhibited malaise, anorexia, slight nausea, when it was discovered that she had an icteric tinge in her serum. She was treated with bed rest for four days and the sub-clinical jaundice disappeared with a return of her icterus index to normal.

Later in November her symptoms of malaise were intensified, she began to lose weight, became progressively weaker, and presented herself for examination. It was decided that she had clinical jaundice of a minor degree; however, the liver was not palpable and her physical examination was essentially normal.

She was hospitalized on Nov. 11 and was seen in consultation by an internist who confirmed the diagnosis of hepatitis, etiology unknown. Her admission laboratory work revealed a urine which was essentially

\* Viron-1 was supplied by Lincoln Laboratories, Inc., Decatur, 111.

negative, except for the presence of bile. Her heterophile antibody titer was negative; the icterus index was 13.8 units (normal being 4 to 6 for the method used); her hemoglobin level was 7.5 gms., hematocrit reading was 21%, white blood count was 13,000 with 72% polymorphs, 22% lymphocytes, 3% monocytes and 3% eosinophiles. Prothrombin time was 105%- of standard. Occult blood was found in her stool. Other diagnostic procedures including chest x-ray and gastrointestinal series were normal.

The patient was treated with bed rest for three days while confirming laboratory tests, observations and examinations were made. Her icterus index rose to 32.5 on Nov. 14. The patient's temperature remained "low grade" being 99.2-99.4 orally at the highest points. After a period of complete bed rest and high carbohydrate diet, the diagnosis was confirmed by the internist, a second consultant, and this clinician. At no time in her illness did she receive chemotherapeutic agents.

#### **Dramatic Improvement**

The administration of Viron-1 was initiated and she received six intravenous 10 cc. injections during the remainder of her hospital stay. Following the second injection of Viron-1 the patient was amazed with her progress and remarked that she had lost the feeling of "being sick." She wanted to go home within 24 hours after Viron-1. injections were initiated, but hospitalization was continued. She was dismissed on Nov. 20, 1959, markedly improved in subjective feeling and dramatically improved clinically.

The patient was seen in my office on Dec. 1, 1959 at which time her white count had dropped to 7,000 with 53 % polymorphs, 37% lymphocytes, 3% monocytes and 4% eosinophiles. Hemoglobin level was 12.8 gms. and her icterus index had dropped to 8.0.

There is no question in the mind of this investigator that the intravenous administration of Viron-1 had a profound therapeutic effect upon this patient. She had obtained minimal benefit from complete bed rest and high carbohydrate diet before the administration of Viron-1. She outwardly

exhibited, and freely discussed with the attending physicians, her feeling of well-being following the administration of intravenous Viron-1. An accurate diagnosis of the exact type of hepatitis was impossible. It was assumed to be viral in nature; however, it may well have been a toxic condition. Other than the academics involved, the exact etiology is relative. The important factor to consider is that she responded to Viron-1 in a most satisfactory manner and one cannot but assume that the medication exerted a profound effect upon her progress.

Past experience with hepatitis of various etiologies has given this observer the impression that recovery from hepatitis, regardless of etiology, is extremely slow and painstaking. The rapid and complete response of this patient to Viron-1 has not been observed following classic and accepted therapeutic measures for treating hepatitis. It is difficult to comprehend a set of circumstances that would coincidentally explain the marked and rapid improvement in a patient as sick as this girl. It was certainly the most dramatic recovery from hepatitis that I have ever observed.

#### **Infectious Mononucleosis**

A while female, age 36, complained of generalized aching, exhaustion, anorexia and malaise. Her physical condition prior to these symptoms had been normal. Fever, remittent in type, accompanied the symptomatic complaints. A complete blood count revealed large vacuolated lymphocytes. A positive heterophile antibody titer of 1:226 was recorded. A diagnosis of acute infectious mononucleosis was made and intravenous Viron-1 therapy was initiated. Clinical and subjective response to three consecutive daily 10 cc. injections was excellent. Symptoms remitted in one week following beginning of therapy. The overall morbidity was reduced beyond expectation for the diagnosed condition. The medication was well tolerated and no adverse side effects were noted. The rapidity of patient response to Viron-1 was dramatic since full recovery from infectious mononucleosis rarely takes place in less than two to three weeks in my experience.

#### **Virus Pneumonia**

A 60-year-old male physician presented himself with a history of excellent health except for his present illness. His symptoms were exhaustion, cough, low grade fever, anorexia, generalized aching and profuse sweating upon exertion. Viral pneumonia—patchy type—of the right upper lobe was found and confirmed by x-ray findings. Treatment consisted of 10 cc. intravenous Viron-1 for three days, bed rest, and ASA Compound. The response was excellent—strength returned on the fourth day and on the fifth day the physician returned to work. The I. V. Viron-1 was well tolerated and no untoward side effects were observed. Viron certainly shortened the expected morbidity for a case of this nature.

#### **Acute Viral Type Pneumonia**

A female, age 47, was in excellent general physical condition with exception of chronic bronchiectasis. When first seen for her present illness this woman was completely debilitated. She was confined to her bed and complained of exhaustion, anorexia and generalized chest pain. Temperature elevation ranged from minimal to normal. A diagnosis was made of acute viral type pneumonia with secondary bacterial involvement of sinus and bronchial tree. She was given intravenous Viron-1, 10 cc. injections, on Oct. 26, 27 and SO and Nov. 3, 6, 9, 1959. No other medication was utilized. Patient felt better after the second injection of Viron-1 and insisted on continued therapy. Her exhaustion syndrome continued to show remarkable improvement. Progress was continuous and the administration of Viron-1 markedly reduced morbidity as compared to her previous recurrent pneumonias. She tolerated the injections well and no adverse side effects were observed.

#### **Viral Pneumonia and Bronchitis**

A male, age 41, was in good physical condition except for the present illness and recurring pain from a herniated lumbosacral disk. He complained of headache, generalized muscular aching and exhaustion. His temperature was 100°-100.4° orally. The diagnosis was acute viral pneumonia and

bronchitis, following acute sinusitis. Injections of intravenous Viron-1, 10 cc., were given on July 14, 15, 16, 1959. The patient was seen for follow-up examination on July 23 and was symptom free. He had experienced marked relief both from sinusitis and viral pneumonia symptoms and had returned to work on fifth day following therapy without my permission. The morbidity period in this case was definitely shortened beyond expectation. Viron-1 was well tolerated by the patient and no side effects were observed.

#### Generalized Viremia

This male, age 72, was in fair general physical condition. Patient complained of "feeling bad", hoarseness, exhaustion and depression following "influenza." His temperature was normal, but he had a persistent cough. I made a diagnosis of generalized viremia with bronchitis and right recurrent laryngeal neuritis. Viron-1 was given intravenously on Oct. 28, 30 and Nov. 6, 1959. He experienced a relief of symptoms and felt better. Marked improvement in symptoms of viremia were observed. The medication was of questionable benefit to the neuritis. Viron-1 was well tolerated—no untoward side effects were observed.

#### Summary

In these selected six cases of probable viral infections, Viron-1 promoted prompt patient response. In four of the above mentioned cases improvement was especially rapid and dramatic. The patients were of different groups and conditions treated were varied. Of significant interest is the shortened morbidity period observed when Viron-1 was given either singly or in conjunction with other therapy. No untoward side effects were observed.

#### Conclusion

In the experience of this investigator daily doses of 2000 mg. of ascorbic acid fortified with B-complex vitamins given intravenously provides a valuable adjunct in the routine management of a variety of acute viral infections. Further investigation is warranted to determine the complete range of viral diseases which can be treated beneficially with this therapeutic adjunct.

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