

ACUTE HEMORRHAGIC JAUNDICE OF EPIDEMIC NATURE IN NEW YORK CITY*

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During the latter part of the years 1919 and 1920, there were admitted to Bellevue Hospital a number of patients with acute hemorrhagic jaundice. The disease, which previously had not been recorded in the Second Medical Division, occurred in epidemic form, usually appearing in December and in the early part of January. Sixteen of the cases in which admission occurred during a period beginning the middle of December, 1919, have been reported by Dr. Douglas Symmers,¹ with special emphasis on the symptomatology and pathology. In view of the fact that he was unable to produce the disease in animals, he was inclined to regard the condition as a toxic process. The purpose of the present paper is to report eleven additional cases in the Second Medical Division of Bellevue Hospital.

In Dr. Symmers' group of sixteen cases, the severity of the disease was most pronounced. In general, his cases were divisible into two symptomatic groups. The first was characterized by bronchitis, lassitude, occasional vomiting and diarrhea, intense jaundice, epistaxis, hematemesis, melena, and hemorrhagic vesicles about the lips and chin. Frequently the disease was associated with pains in various localities, stupor and delirium. The second group was characterized by severe jaundice, wild delirium and rapid death. Of the sixteen patients, nine died—a mortality of 56.2 per cent. In our cases, ten of which occurred in December, 1920, and one in December, 1921, the disease ran a much milder course with but two deaths, a mortality of 18 + per cent.

Clinically, these cases presented features which were strikingly like spirochetosis icterohemorrhagica, formerly known as Weil's disease, and also resembled cases of that disease which I saw in France. Since the publication of the first thorough study of the epidemic type by Weil, in 1886, outbreaks of the disease have been reported in various parts of the world. Epidemics have been reported from Syria, Greece, Egypt, India, South Africa² and Japan.³ During the recent war, an epidemic was reported among the British soldiers on the western front.⁴ An outbreak of jaundice throughout the state of New York⁵ has attracted considerable attention during the past year. It is difficult to estimate accurately the number of cases which have occurred in the various localities throughout the state, but from the published reports the total number would apparently exceed 400.

In 1914, a group of Japanese, Inada and his co-workers, studying the disease, showed that the blood of patients produced jaundice when injected into

guinea-pigs, and also obtained spirochetes from the blood and urine of the patients themselves. Stokes later confirmed this work in an epidemic occurring on the western front in the British Army. The organism has been found by the Japanese workers,⁶ Stokes,⁷ Noguchi⁸ and others⁹ in rats, and it is probable that the disease is conveyed to man by this rodent. The disease, as described, is generally characterized by sudden febrile onset with pronounced gastro-intestinal symptoms and rapidly developing jaundice with relapses.

OBSERVATIONS IN ELEVEN CASES

All of the cases to be reviewed in this paper occurred in men, the ages varying between 22 and 65, four of the number being between the ages of 22 and 30. The onset of illness was sudden, characterized by severe pains in the calf muscles and back, headache, nausea, vomiting, nosebleed, herpes, and chills and fever. Briefly, the patients were seized with an acute febrile illness, with muscle pains and prostration. The jaundice appeared from the third to the seventh day after the onset of the illness, the average day of onset in the eleven cases being the fifth. On admission to the hospital the patients were seen to be acutely ill, and some were delirious. One patient had a bronchitis. The jaundice was marked; the tongue was frequently dry, sometimes showing dry blood on the surface. In the majority, there was an herpetic eruption about the lips and chin which contained thin, sanguineous fluid. In drying, dark red crusts were formed.

Fever.—At the time of admission, the temperature ranged between 99 and 104 F., the average temperature being around 101. After from four to fifteen days, the temperature reached normal, and usually remained so from five to ten days. In seven cases there was a definite period of secondary fever, which lasted from four to nine days. At the end of from ten to twenty-five days the patients showed signs of convalescence.

Gastro-Intestinal.—Anorexia was common to all. Bloody diarrhea was present in three cases. The stools were generally clay-colored and constipated. The vomiting was constant at the onset of the illness, often recurring after admission and subsiding with improvement. Abdominal pain was present in five cases—in three, sufficient to warrant suspicion of gallbladder infection.

Parotid Gland.—In one fatal case the parotid gland was infected. From the gland a pure growth of *Staphylococcus albus* was obtained. It is probable that the infection occurred from the mouth.

Liver.—In two cases the liver was found slightly enlarged. It was not frequently tender.

Spleen.—This was not palpable in any case.

Lymph Glands.—These were not enlarged.

Respiratory System.—Bleeding from the nose occurred in five of the series. Hemoptysis was present in two cases. Pain was referred to the chest in three cases—two of these showing definite signs of a bronchitis. In one case, the sputum was described by the intern as brownish.

Circulatory System.—There was little noteworthy in the examination of the heart in cases of this series.

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One patient had auricular fibrillation on admission, and died late in the course of his disease. Vascular thickening was found common to the senile patients. The white blood cell counts varied between 9,000 and 21,000, the average being about 10,000. Polymorphonuclears varied between 60 and 90 per cent. One patient, however, had a leukopenia of 3,000. The hemoglobin varied between 70 per cent. and normal.

Urinary System.—The most constant feature of the urine was the large quantity of bile present. Albumin was present in quantities varying from a faint trace to a cloud. Hyaline and granular casts were found in all cases. At times, free red blood cells and pus were found. In one case, sugar was found, which was not in sufficient quantity to be fermented by yeast.

Nervous System.—Frontal headache was a common complaint. Delirium was recorded in three cases. Pruritus, probably due to jaundice, occurred in several cases. Weakness to the extent of prostration was at times marked. Dizziness as an initial symptom was not common. Drowsiness was noted in two cases. Coma occurred late in two fatal cases. Mental confusion and restlessness were present in two cases.

Muscle and Abdominal Pains.—Muscle pains were complained of in nine cases, usually beginning in the calf muscle, and extending to the back. Often there was general muscular soreness. Tenderness of the calf muscles was not uncommonly found. Frequently, in the latter part of the disease, when the patient was allowed up, generalized pain, particularly in the lower extremities, was recorded.

Skin.—The jaundice varied in appearance from a greenish yellow to a lemon yellow tint. At times of relapse there was no appreciable increase in jaundice. Besides herpes, the noteworthy features in the skin were purpuric spots on the sides of the abdomen and chest in two cases and, in one case, a diffuse macular erythema over the body. In another case, petechial spots were recorded.

In eight cases, bile was obtained from the duodenum by the Rehfuß tube. This was examined microscopically, and in two cases in which there was bleeding elsewhere, contained blood that was apparently non-traumatic. Cultures were taken on blood agar plates, on plain agar plates, aerobically and by the petrolatum anaerobic method. *Bacillus proteus* was reported in one case. *Staphylococcus albus* was frequently found, as well as other types of cocci which were not identified. Sediments of urine were injected into guinea-pigs in quantities of from 2 to 5 c.c. at different periods during the course of the disease and, in several of the cases showing relapses, repeated daily. Sediments of bile were also injected intraperitoneally with negative results. In the early cases, blood was obtained and injected into the peritoneal cavity of a guinea-pig. The results were uniformly negative. Attempts were made to detect spirochetes in stained specimens of the urinary sediment. The method employed consisted in the fixation of the smear of the sediment by methyl alcohol, and staining from two to twenty-four hours with Giemsa's solution. In one case of the series, a spirochete was found resembling *Spirochaeta refringens*. This was thought to be a contamination; the finding was not repeated after the examination of many other slides, and the guinea-pig injected from this case was not jaundiced. Stains of the kidneys and liver of this guinea-pig made by Dr. Symmers, after the method of Levaditi, were reported negative for spirochetes.

SUMMARY AND CONCLUSIONS

1. In the epidemic of eleven cases of jaundice reported, the symptomatology, physical findings and progress resembled those of Weil's disease.

2. The cases are similar to a group of sixteen occurring a year before at Bellevue Hospital, but are of a less severe type and show a lower mortality.

3. Repeated attempts to determine the causative agent have been uniformly without success.

4. In view of the repeatedly futile attempts to isolate the leptospira from this group of cases, it would seem that we have been dealing with another type of infection or toxemia, the nature of which is at present unknown.

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SIMULTANEOUS VARIATION IN ACIDITY
OF DIFFERENT PORTIONS OF
GASTRIC CONTENTS

ITS RELATION TO FRACTIONAL ANALYSIS *

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Papers have been published during the past year by Gorham,¹ Wheelon² and Kopeloff³ showing the simultaneous variation in acidity in different portions of the gastric contents. These observations are important from a clinical standpoint, if they can be verified. We have carried out a series of similar observations in about fifty cases, making about 500 analyses of gastric contents, to (1) see what variation exists; (2) determine the cause of the variation; (3) try to overcome it, and (4) study its relation to fractional gastric analysis as ordinarily carried out.

Fractional analysis is based, either consciously or unconsciously, on the assumption that small fractions of the gastric contents are representative of the whole contents of the stomach at the time, and that fractional curves, as ordinarily obtained, represent changes in gastric secretion.

METHODS

Forty of these fifty cases were routine gastrointestinal patients, and ten were healthy persons. An Ewald test breakfast was given, the Rehfuß tube was passed, and at the end of an hour 10 c.c. fractions of the gastric contents were aspirated rapidly, one after another, by the method suggested by Gorham, so that the stomach was completely emptied in this way in from three to five minutes. These fractions were titrated for free and total acid, Toepfer's reagent and phenolphthalein, the most commonly used indicators, being employed. The position of the tip of the Rehfuß tube was located exactly by means of the fluoroscope before, during and after aspiration of the gastric contents. The presence or absence of duodenal regurgitation was decided by tests for trypsin and bile in the gastric contents. In about one third of these cases an ordinary fractional analysis by the Rehfuß method,

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