

MENINGOCOCCIC ENDOCARDITIS: REPORT OF CASE

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*History.*—G. A., man, aged 24, with negative family history, had had the usual diseases of childhood, except scarlet fever and diphtheria. Since childhood he had been in perfect health. His present illness began about 4 p. m., Nov. 28, 1918. He had a severe frontal headache, fever and sweats. His symptoms continued during the night, the headache allowing him to get very little rest. The next morning, in addition to the headache, which was about the same, he had severe pains in the calves of the legs. He remained in quarters during the day and the following night. On the morning of November 30 he noticed an eruption on the eyelids and on the trunk, arms and thighs. He was admitted to the base hospital at 8 a. m., November 30. When seen shortly afterward his headache was better, the aching in the legs had disappeared, he had no cold nor cough, his appetite was poor, and he felt feverish.

*Examination.*—The patient was well developed, and weighed approximately 180 pounds. His mentality was clear. He appeared slightly depressed, but not irritable or nervous. The only striking objective sign was the purpuric rash, which was macular, about 0.25 to 0.5 cm. in diameter, and very scattered. It appeared on the upper eyelids, the shoulder and the pelvic girdle, arms, hands and thighs. The reflexes at this time showed nothing remarkable. The buccal mucous membrane and the throat were red. All other physical signs were negative.

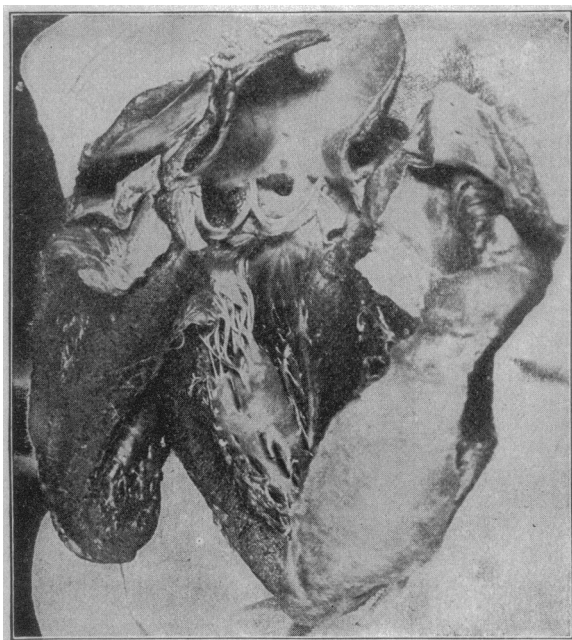


Fig. 1.—Photograph of the heart, showing aortic valve with extensive lesion on one cusp. On the inner surface of the cusp is seen a vegetation, while at the base of the outer surface there is a small, deep ulceration. Smears from this showed many meningococci.

*Treatment and Course.*—Shortly after admission, lumbar puncture yielded 40 c.c. of fairly cloudy fluid under strong pressure. Thirty c.c. of antiserum were administered intraspinally and 1 c.c. hypodermically as a desensitizing dose. An hour later, 120 c.c. of antiserum were administered intravenously. Daily intraspinal and intravenous injections, in the same amounts as stated above, were administered up to December 6. During this time the patient showed gradual improvement. The spinal fluid cleared and became free of meningococci. His appetite improved, and he was comfort-

able except for the serum urticaria which appeared, December 5. Neck stiffness and Kernig's sign appeared after the first treatment, and persisted until the end.

No other notable change occurred until December 10, when the routine morning examination revealed a purpuric spot about the size of a dime on the dorsum of the right hand, and another on the outer surface of the left ankle. The patient had rested well during the night and remained comfortable until noon, when he developed a severe headache, together with numerous additional purpuric spots on the hands and feet. Lumbar puncture revealed a cloudy fluid

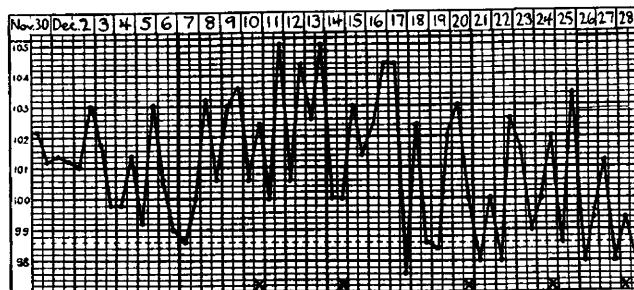


Fig. 2.—In addition to furnishing a good example of a "septic temperature curve," this chart shows how each crop of petechiae was preceded from twenty-four to forty-eight hours by a rise of temperature.

under rather low pressure. Daily intraspinal and intravenous treatments, as before, were given for three days, with about the same degree of improvement. The next relapse occurred, December 14, and was again preceded by a purpuric rash. The symptoms during this recurrence being rather mild, and the patient's reaction to antiserum being more intense, he received only one intraspinal and one intravenous injection. The next exacerbation was December 20 and was preceded by purpuric spots on the hands, elbows, knees and feet. The spinal fluid was slightly cloudy. Thirty c.c. of antiserum were given intraspinally. The intravenous treatment, though administered very slowly, had to be almost immediately discontinued owing to a most violent reaction.

From this time on the patient's condition became gradually worse. Intraspinal injections were given from December 20 to December 24, inclusive.

December 27, another crop of purpuric spots appeared. There was marked mental apathy. Lumbar puncture gave 45 c.c. of bloody fluid. Thirty c.c. of antiserum were given intraspinally. The patient's condition being so desperate, it was considered advisable to give serum intravenously at all hazards. One hundred and forty c.c. were so administered in spite of the patient's becoming violent and dyspneic. The same treatment was repeated, December 28.

December 29, another crop of spots appeared, not so intense in color. The patient sank rapidly, and died at 11:45 a. m. The total amount of serum administered was 1,725 c.c.

*Laboratory Findings.*—The routine examinations showed a normal urine; the feces were free from parasitic ova, and the throat culture was negative for hemolytic streptococci.

*Spinal Fluid:* At the first puncture, 40 c.c. of turbid fluid were obtained, showing much pus and a moderate number of meningococci in the smears. Cultures and agglutination test revealed the organism to be a normal meningococcus Type I. A potency test of the treatment serum used in the case was made with the strain of organism causing the infection. Agglutination was obtained in a 1:400 dilution. Specimens of spinal fluid from subsequent punctures gave the showings seen in the accompanying table.

*Necropsy.*—*Body:* The patient was a white man, well developed and fairly well nourished. Rigor mortis was present. The skin of the trunk and the limbs showed numerous small red petechiae, and many small, faintly brownish spots, evidently the site of earlier lesions of a similar nature.

*Head:* The membranes over the convexity of the brain were moderately congested, but showed no exudate nor excess of fluid. The base of the brain about the circle of Willis, and over the surface of the pons, showed a moderate

amount of yellowish exudate beneath the pia, which itself was thickened and adherent. The fluid escaping from the spinal canal was moderately in excess, but not especially cloudy. There were numerous minute hemorrhages over the surface of the cerebellum near the pons. The dura covering the base of the skull was noticeably injected, but showed no exudate.

**Spinal Cord:** The cord and membranes showed practically no gross changes. An occasional small ecchymotic spot was seen beneath the pia. No lesions were noted in the cauda equina. There was some ecchymosis in the muscles at the site of the lumbar punctures.

**Abdomen:** The peritoneum was normal. The intestine was distended with gas. The bladder was full. The liver was at the costal border.

**Pleural cavities:** These were free.

**Lungs:** These were voluminous and filled with air. There was an old scar at the right apex. There were atelectatic areas at the right base.

**Pericardium:** There were numerous small ecchymoses. The membrane lacked the usual luster, and the sac contained a few drops of a viscid, yellowish exudate.

**Heart:** There was a slight enlargement, apparently due to hypertrophy of the left ventricle. All the cavities contained fibrin clots. The valves were normal, with the exception of the aortic. The posterior cusp was the site of a pinkish, irregular vegetation, fleshlike in consistency, and with a broad base measuring 1 cm in diameter. The edge of the cusp was free, the lesion occupying the base and involving

LABORATORY FINDINGS IN THE SPINAL FLUID

Date	Amt. of Fluid, Cc.	Pus	Organisms (Smear)
Dec. 2	30	Present	Present
Dec. 3	40	Present	Absent
Dec. 4	40	Present	Absent
Dec. 5	40	Present	Absent
Dec. 10	35	Present	Present
Dec. 11	45	Present	Absent
Dec. 12	30	Slight	Absent
Dec. 18	40	Present	Present
Dec. 21	35	Slight	Absent
Dec. 22	40	Slight	Absent
Dec. 23	30	Slight	Present
Dec. 27	40	Present	Absent

both surfaces. The outer portion of the lesion was ulcerated into the heart wall for a distance of several millimeters. Other minute vegetations were seen on this and the adjacent cusps. There were a few small atheromatous areas on the ascending aorta.

**Spleen:** This was two and a half times normal size, very soft and rather pale.

**Liver:** The liver was pale brownish, not enlarged, and with consistency diminished.

**Pancreas:** There was nothing worthy of note.

**Stomach:** There were a few petechial spots beneath the peritoneum, and also in the omentum.

**Intestine:** This showed nothing remarkable.

**Kidneys:** These were large and injected, with indistinct markings and numerous small hemorrhages beneath the pelvic epithelium.

**Bacteriologic Findings:** Smears from the ulcerated base of vegetation on the heart valve showed many gram-negative diplococci.

**Anatomic Diagnosis:** Leptomeningitis and pachymeningitis (subacute) of the brain and spinal cord were diagnosed. Incipient pericarditis and acute (aortic) endocarditis were found. Petechiae of the skin, the stomach, the omentum and the pelvis of the kidneys were present.

The cause of death was cerebrospinal fever.

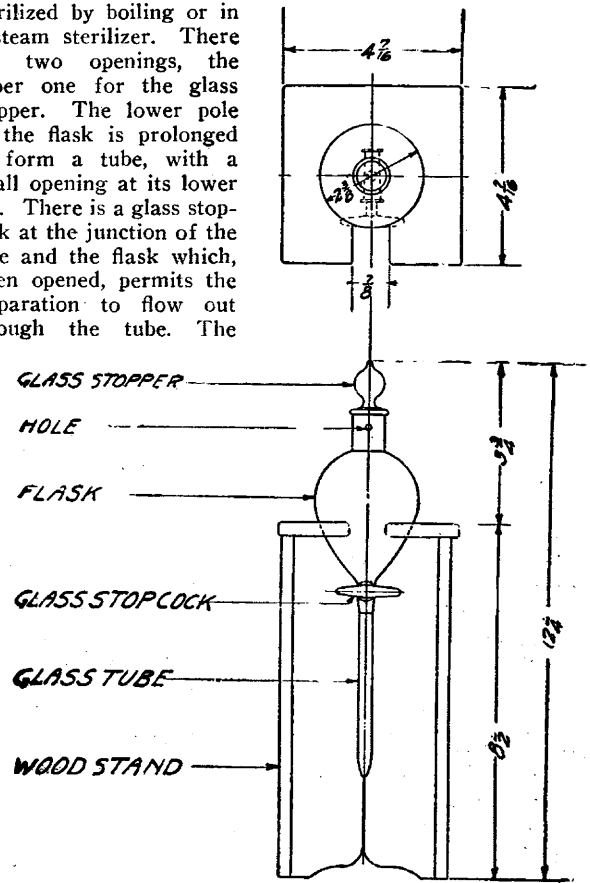
**Genius and Eugenics.**—Statistics show that genius knows no caste. Men of great achievements originate in all classes in about equal percentages—they cannot be bred. If eugenics plays a part, its influence is greatly overshadowed by other factors. Getting the right start and then giving full play to one's bent are the vital factors in developing capacity for great achievement.—Dr. P. G. Nutting, *Scientific Monthly*, November, 1918.

DICHLORAMIN-T CONTAINER

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Those using dichloramin-T have difficulty in applying the solution because of an unsatisfactory apparatus. Atomizers, syringes, medicine droppers and even bottles containing the solution have been used, but all have their faults. Owing to the density of the liquid, it is rather difficult to spray dichloramin-T through an atomizer. Syringes are unsatisfactory because they entail too frequent handling; they are time consuming in drawing up the solution, and contamination of the instrument is very likely. Pouring the liquid from a bottle is crude, while the medicine dropper is very unsatisfactory.

The apparatus here illustrated has proved satisfactory. The container is a pear-shaped glass flask having a capacity of 4 ounces. There are no rubber connections. It can be easily sterilized by boiling or in a steam sterilizer. There are two openings, the upper one for the glass stopper. The lower pole of the flask is prolonged to form a tube, with a small opening at its lower end. There is a glass stopcock at the junction of the tube and the flask which, when opened, permits the preparation to flow out through the tube. The



Dichloramin-T apparatus.

stopper is of blown glass. There is a small hole in the neck of the flask and in the stopper. When the flask is closed and the stopcock opened, the liquid runs out slowly. By turning the stopper until the two holes are in apposition, the air pressure within the flask is increased and the flow of dichloramin-T is thereby accelerated.

The solution cannot be contaminated by dust or air while in the flask.

The dichloramin-T flask is kept on a small white enameled wooden stand. It rests snug in its place and cannot fall off.

When a wounded area is to be treated, the flask is lifted out of its stand and carried to the patient. The stopcock is opened and the liquid flows slowly or rapidly at the will of the operator, over and into the wound, bathing every recess.

The same apparatus, but of greater capacity, is used as a container for neutral solution of chlorinated soda.

The advantages in the use of this apparatus are: (1) convenience in treating wounds; (2) simplicity of construction; (3) avoidance of contamination of the dichloramin-T, and (4) the saving of time which its employment effects.

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