

RESTRICTED

Subcommittee on Burns 42-7

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COMMITTEE ON MEDICAL RESEARCH

of the
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Subcommittee on Burns

Minutes of Fifth Meeting
December 8, 1942
Boston

Those present at the special meeting in Boston were Dr. A. O. Whipple, chairman, Drs. E. D. Churchill, Robert Elman, R. D. McClure, and S. L. Koch, members of the committee; Lt. Col. B. N. Carter and D. B. Kendrick, Jr. of the Army; Capt. E. W. Brown and C. N. Shaar, and Lt. Comdr. T. H. Peterson of the Navy; Drs. Frank Meleney and Champ Lyons of the Subcommittee on Surgical Infections; Dr. Chester S. Keefer of the Committee on Chemotherapy; Dr. Chas. C. Lund of Boston City Hospital, and Drs. Oliver Cope, Robert Beecher, C. Burbank and Bradford Cannon of the Massachusetts General Hospital.

The morning was spent with Dr. Lund in reviewing the cases of burns received and treated at the Boston City Hospital.

One hundred thirty-four cases reached the wards of the hospital and were counted as admissions. One hundred eighty corpses reached the accident floor; in addition, between 10 and 15 individuals, still breathing on arrival at the accident floor, died within a few minutes and were not counted as hospital admissions. About six patients, primarily respiratory, were cared for in three different medical services. During the first 48 hours the two newly opened wards--"G" and "H"--were staffed without regard to service, and during the period of 48 hours these patients were not assigned to any particular service. After the first 48 hours five surgical services cared for the bulk of the patients.

Three methods of local treatment were used: tannic acid, silver nitrate to bodies and arms of about a dozen cases; vaseline gauze strips, without pressure, to over half the hands and faces and, to a small extent, to bodies and arms, but in the latter case never to any extensive areas; triple dye to a large number of cases, in some instances including hands, faces and feet. The exact numbers of these cannot be compiled as yet as so many of the records are still scattered around the wards and it has not yet been possible to establish a complete duplicate record file in the central office.

A few more than a hundred cases received 1065 units of plasma in 30 hours. About 100 units were used during the following two days. Perhaps

a dozen cases received albumin in addition to plasma. The largest amount was 20 units; the smallest, one unit.

Administration of transfusions to about a dozen of the worst cases began on the third day. Some of these patients have received five pints.

All cases received morphine in the accident ward, and during the first 24 hours many received more in the wards. In cases with respiratory complications it is probable that too much morphine was sometimes used.

Oxygen and suction removal of tracheal and bronchial secretions were used in many cases; tracheotomy, in about a dozen.

Chemotherapy was begun at the end of 24 hours and was employed in practically all cases, 1 gram of sulfadiazine q. 4 h. being the standard initial dose. Most cases received it for a week, and the serious cases are still getting it.

About 60 per cent of the cases had lung complications, as shown by x-ray and physical examination. Practically none of them went on to pneumonia. Eight cases had hemoglobinuria; of them, seven are dead and the eighth is very sick.

Complications involving burn surfaces were rare. One man had a third degree injury of the wrist incised to relieve pressure of fluid in the tissues of the hand. One patient, originally treated with triple dye, with very extensive superficial third degree burns began to have fever and to appear toxic after softening of the eschar from the dressings. These were stopped, and he was retanned with triple dye, with marked lowering of his fever and toxicity.

There have been 33 deaths; 19 the first day, six the second, one or two each day during the next five, and one on the tenth day. None has died since. At least two will be fortunate if they recover. About 40 are still under treatment in the hospital. There have been a number of transfers to other hospitals, chiefly the Chelsea Naval Hospital. So far as we know there have been no deaths and no deaths are expected in the transferred patients.

Dr. Lund stated on December 17th:

"I am only going to make two tentative conclusions now. First, more careful thought in the preparation of systematic attention to the respiratory features of burns involved in such fires is very important; and second, in this group of cases the differences between one form of surface therapy and another fade into almost insignificance compared to other aspects of the cases."

After luncheon at the Boston City Hospital the committee was taken to the Massachusetts General Hospital, and the cases there were reviewed.

At the Massachusetts General Hospital 39 patients were admitted, of whom 30 had received burns of clinical significance. Later evaluation showed 11 with full thickness loss of skin (third degree).

All patients were placed on a single floor (40 bed) and nominally on a single service, but responsibility centered in a staff group from both surgical services acting as a single emergency service. The Massachusetts General Hospital system of "Special Assignments" makes this automatic without any administrative difficulties. House staffs from both surgical services combine in the care of patients.

Local treatment. No cleansing or debridement were carried out. Fine mesh strips of gauze impregnated with boric ointment (10%) were applied on the burned area. Sufficient sterile mechanics' waste, gauze and cotton roller were added to make a bulky dressing. Ace elastic bandages were employed to secure firm even pressure.

The first dressing was changed on the fifth day. Others were dressed on subsequent days in order to provide a visual record of the appearance of the burned surface.

General treatment. Thirty-three of the 39 patients received plasma. The average amount was 3.6 units (250 c.c.) per patient. In the first seven days a total of 141 units was administered. The largest amount given to a single patient in the first 24 hours was nine units.

Transfusions were used later to correct anemia, particularly in those patients with third degree burns.

Sedation. Morphine, gr. 1/4, was administered on admission. In general it was found that three types of excitement were occurring, each with a specific indication for treatment. Pain required morphine; hysteria responded to barbiturates; anoxia required oxygen.

Chemotherapy. Two grams of sulfadiazine were given intravenously at two a.m. Thereafter those able to take the drug by mouth received one gram every six hours. Those unable to take the drug by mouth received further intravenous medication at 12 noon, at 9 p.m., and every 12 hours thereafter. Blood levels of 5 to 10 mg. per cent were maintained.

On the evening of the sixth day all patients with a rectal temperature sustained at 101° or above received 5000 units of penicillin intramuscularly. All but one of these patients (who had no burn at all) later were found to have third degree burns.

Complications. Lung. The typical lung pathology requires extended description. No true (bacterial) pneumonia has been observed either clinically, by x-ray, or at autopsy.

Kidney. Hemoglobinuria was encountered in three patients with extensive third degree burns. All seriously ill patients

showed albuminuria. Late microscopic finding of blood cells has been interpreted as secondary to chemotherapy, and the dosage discontinued or reduced. One high NPN occurred in a patient with prolonged vomiting.

Burned surfaces. First and second degree burns healed kindly without secondary infection. Third degree areas have shown heavy contamination, particularly with staphylococcus in the necrotic tissue. No systemic reactions or local characteristics of the wounds have suggested actual invasion of living tissue by bacterial infection.

One patient with third degree loss was discharged to Chelsea Naval Hospital for grafting, 10 patients with third degree loss remained in the hospital December 18. All others were discharged as of December 12th or previously.

Dr. Churchill stated: "The following conclusions seem justifiable as of Dec. 31, 1942:

"An occlusive dressing with bland ointment combined with sulfadiazine administered systemically permits clean healing of superficial burns by 12 days. Dressings need not be changed for five to twelve days. With diazine started immediately, diazine is demonstrable in the bleb fluid in levels approximating the blood concentration. The combined administration of diazine administered immediately and penicillin started on 6th day did not prevent heavy contamination of the necrotic slough in deep burns with staphylococci and other bacteria. There was no evidence, however, of invasion of viable tissue or serious systemic reaction to this contamination.

"Criteria other than positive cultures are necessary in attempting to assay the bacteriostatic action of local or general therapy in third degree burns. It seems unlikely that locally applied or systemically administered bactericidal or bacteriostatic agents can maintain aseptic necrosis of skin. The question may be propounded as to whether the action of bacteria may not hasten the autolysis and separation of slough. If the contaminating organisms do not (1) invade living tissue, (2) produce systemic reaction by toxin liberation, (3) delay skin grafting, (4) increase the pain or cause the need for more frequent dressings, their actual presence is not necessarily harmful."

After seeing the patients and hearing the report of various eye witnesses as to their reactions and observations on the night of the catastrophe, colored photographs were shown illustrating the appearance of burned patients in the early stages and during the progress of treatment both at the City Hospital and at the Massachusetts General Hospital. The x-ray films of a number of patients with varying types and degrees of lung involvement were shown and discussed by Dr. Schatzki.

The Committee then discussed again the recommendations to be made to the Surgeons General of the Army and Navy concerning first aid treatment and definitive treatment of burns in the armed forces. The recommendations concurred in have already been reported. (Minutes of meeting of November 24, 1942).

General discussions were continued during dinner and until 9:30 p.m.

Dr. Whipple read a report describing the paraffin treatment as used at Mare Island Navy Yard. Dr. Whipple expressed the opinion, (1) that they have overlooked the danger of incurring secondary infection, (2) that paraffin does not seal the burned area, (3) that as first aid treatment it is applicable only in the Navy. Further data are being accumulated so that an advised opinion can be given.

Dr. Lyons expressed the opinion that any effective medication must work from within out. Penicillin cannot be applied locally; it cannot be applied to every wound; it can only be given intravenously.

Dr. Cope stated that diffusible substances reach the surface during the first three days; we do not know at this time how long afterward this condition obtains. Penicillin may provide the answer. It may be possible to give it less often than is being done for the cases now under treatment.

It was moved that the Surgeon General be informed that penicillin is being studied and that a report will be submitted later.

It was moved that the Committee express its appreciation and gratitude to Drs. Churchill and Lund for a most instructive and worth while experience. Dr. Whipple stated that the work accomplished was a wonderful example of what men can do under favorable circumstances.

Lt. Col. Carter expressed appreciation in behalf of the Surgeon General.

Meeting was adjourned at 9:30 p.m.

Sumner L. Koch
Secretary