Reports of Scientific Meetings

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A section devoted to review of meetings not attended by large numbers of anesthesiologists but meetings at which matters of interest to anesthesiologists are considered.

Conference on Early Treatment of Severe Burns

A CONFERENCE on "Early Treatment of Severe Burns" was held in New York City, October 3 to October 5, 1966, under the auspices of the New York Academy of Sciences. The meetings were introduced by the Conference Chairman, C. L. Fox, Jr. (College of Physicians and Surgeons, Columbia Univ., New York City), who indicated the scope of the problem—over 12,000 civilian deaths annually and probably 360,000 patients hospitalized with burns.

The meeting considered a variety of aspects of the pathophysiology and therapy of burns. Of special interest to anesthesiologists was the emphasis G. G. Nahas (College of Physicians and Surgeons) placed on the metabolic acidosis which may occur in severe burns, an acidosis which may impair the ability of the body to mobilize fuel stores and to increase metabolism above basal level. The hemodynamic effects of metabolic acidosis in cholera and its implications for fluid repletion in severe burns were emphasized by Y. Enson and associates (College of Physicians and Surgeons). In cholera, a highly significant relation was found between blood *p*H and the ratio of central to total blood volume. W. E. Zimmerman (University of Freiburg, Germany) also emphasized the favorable effects of antiacidotic therapy in the treatment of burns.

The problem as to which intravenous fluids are most appropriate in the management of severely burned patients was discussed from several points of view by different investigators. Unanimity of opinion was, however, not achieved. S. M. Rosenthal (National Institutes of Health, Bethesda, Maryland), for example, expressed the opinion that fluid therapy with plasma and whole blood is more effective than fluid therapy with saline, and that glucose in colloid solutions which do not contain sodium is even less effective than saline alone. C. L. Fox, Jr., found, however, in studies with burned monkeys that adding blood and plasma to Ringer's lactate solution did not enhance the therapeutic results, while J. Lyons (Dartmouth Medical School, Hanover, New Hampshire) and F. D. Moore reported that, following the infusion of balanced salt solution, the plasma volume to interstitial fluid ratio (acutely reduced by hemorrhage) rose, indicating that the post-hemorrhagic state biases the distribution of infused fluid toward the plasma volume, which may be important after burns. Lyons and Moore found no evidence of an anomalous loss of extracellular fluid, and intracellular water distribution was not altered. In contrast, mannitol infusion dislocated up to 1,400 ml. of cellular water into the extracellular compartment. On the other hand, K. Markley (National Institutes of Health, Bethesda, Maryland) reported that, in adults, saline solutions were more effective than low-electrolyte fluids and the administration of plasma did not seem to lower shock mortality. Furthermore, both C. R. Baxter and G. T. Shires (Southwestern Medical School, Dallas, Texas) and H. C. Polk, Jr. (University of Miami, Miami, Florida) found improved results in burn patients treated with Ringer's lactate solution, while B. W. Haynes, Jr. (Medical College of Virginia, Richmond, Va.) found that dextran demonstrated positive benefits in

maintaining circulatory stability and promoting urinary volume. Such differences of opinion and experimental results are indicative of the many complex patho-physiological mechanisms which accompany severe burns. The simplified concept that the major early disturbance in severe burns is a plasma extravasation in the burned area can no longer be accepted. The separate movements of electrolytes, colloids, and water from one compartment to another with differential alterations of permeability to these substances, the production of toxic compounds, hormonal and metabolic changes, disturbances in peripheral blood flow and vasomotor tone and many other factors must also be considered. In view of this complexity, it seems remarkable that large amounts of alkaline electrolyte solutions containing sodium, given by mouth and supplemented parenterally, are, according to the reports of many investigators, at present the best therapy in the early phase of severe burns. Such an observation was made 22 years ago by the chairman of the conference, Charles L. Fox, Jr.

The respiratory status of burned patients was also commented upon by several participants. B. A. Zikria (College of Physicians and Surgeons) reported that during the acute phase of respiratory burns, there is a significant depression of venous clotting time, increased water and sodium contents of the lung, and decreased lymph drainage from the lungs. There is also a greater tendency for atelectasis than can be explained by mechanical obstruction. H. N. Harrison (Tufts University, Boston) found that normal oxygenation can be readily achieved when 100 per cent O_2 is used with young burn patients. The response of older patients to oxygen therapy is incompletely described and somewhat in doubt. When hypoxemia is present it appears to be due to alveolo-capillary block or hypoventilation secondary to bronchial occlusion or restriction of chest movement. J. M. Kinney and A. B. Lee, Jr. (College of Physicians and Surgeons) emphasize that respiratory acidosis as well as problems of proper oxygenation are also frequent in burned patients and that the management of ventilation must be individually determined in each patient and the efficacy of treatment quantitatively evaluated by repeated measurements of blood gas tensions and *p*H.

A number of papers were also presented on the metabolic and hormonal response to burns. H. S. Soroff (Tufts New England Medical Center, Boston) found that, in severely burned patients, an increase in serum nonesterified fatty acid levels, increased storage of nitrogen, potassium, sodium and chloride and weight gain occurred with growth hormone administration. At the same time, there was an increase in oxygen utilization and a decrease in respiratory quotient. Mc. C. Goodall (Shriners Burns Institute, University of Texas, Galveston, Texas) reported that, in 100 severely burned subjects, there was evidence of adrenal medullary depletion in about $\frac{2}{3}$ of the patients who died and evidence of sympathetic nerve depletion in $\frac{1}{3}$ of the patients who died. In a study on the metabolic effects of topical silver nitrate therapy in 20 burn patients, J. F. Burke (Massachusetts General Hospital, Boston) found that electrolyte loss was a relative constant amount, allowing for the development of a formula for predicting replacement needs. H. C. Polk, Jr. and R. E. Tessler (University of Miami, Miami, Florida) reported that, in patients treated with 0.5 per cent silver nitrate solution, measured sodium loss ranged from 0.25–0.92 mEq. /cm.^{2} burned surface/24 hours. H. B. Stoner (Medical Research Council Laboratories, Carshalton, England) reported that a fall in body temperature seems to be part of the initial response to all types of injury. F. T. Caldwell, Jr. and L. W. Miksche (State University of New York, Syracuse, New York) found in rats that although the increase in evaporative heat loss reached a maximum when the eschar separated this loss was relatively small but that nevertheless, six hours post-burn rats were unable to maintain body temperature. The work of C. Jelenko, III (University of Maryland, Baltimore) suggested that the burn eschar can retain some water in the burned area and reduction of this water loss requires extrinsic methods. The fact that the use of sulfamylon acetate did not reduce insensible water loss in rats was commented on by H. S. Soroff (Tufts New England Medical Center, Boston).

The advantages and disadvantages of the topical application of different substances to burned areas were extensively reported and, again, complete unanimity was not achieved, especially with regard to the relative merits of silver nitrate and sulfamylon. A number of investigators, W. M. Monafo (Washington University, St. Louis), C. A. Moyers (Michigan Technological University, Houghton, Michigan) and S. E. Ziffren (University of Iowa) reported that the use of 0.5 per cent silver nitrate solution as a wound dressing had both a beneficial bacteriostatic effect and inhibited excessive flux of water vapor through the wound. R. B. Lindberg and associates (U. S. Army Surgical Research Unit, Ft. Sam Houston, Texas), however, found that a topical application of sulfamylon effectively prevented burn wound sepsis in rats and that survival was increased strikingly in a series of over 500 burn patients treated in a similar way. In comparing the use of silver nitrate with sulfamylon, R. B. Berggren (Ohio State Univ. Hospital, Columbus, Ohio) found both equally effective, but B. G. Macmillan and W. A. Altemeier (University of Cincinnati Medical College, Ohio) reported that best results (in terms of mean weight loss and mean day autogenous skin coverage) were obtained in patients treated with sulfamylon or gentamycin as compared to silver nitrate. Certainly enough evidence was presented to raise serious question as to whether topical treatment with sulfamylon is not in fact superior to the recently advocated treatment with silver nitrate.

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