FROM: SGHSG 29 May 1973

SUBJ: Semi-Annual Research Progress Report

TO: SGHSG
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IN TURN

1. F-12 (71) "Evaluation of Anti-human Lymphocyte Globulin Preparations"

This study has proven to be exceedingly difficult. Problems relating to the preparation of the antigen, immunization of the animals, purification of the immune globulin and yield are far in excess of the potential value of the product for the in-house transplantation program. The investigator has elected to close out the study in order to conserve resources. No manuscripts are contemplated.

2. S-17 (72) "A Controlled Study to Determine the Clinical Value of Asanguineous Hypothermic Total Body Perfusion (Total Body Washout or TBW) in the Resuscitation and Subsequent Survival of Patients in Stage IV Hepatic Coma".

Six patients (total) have now entered the in-house study. The first two have been previously reported. Subsequently four additional patients have been treated; two with repeat TBW. None of the four survived, although transient improvement was noted in two (neither of the repeat TBW patients responded).

Technically the procedure has become "routinized". The deaths that have occurred have demonstrated a uniform triad of massive hepatic neurosis, severe bilateral pneumonic infiltration associated with sepsis and cerebral edema. One question arising from this small experience and evolving from added laboratory observations would seem to be whether the oncotic pressure of the perfusate is adequate. The investigator regards the consistent finding of anasarca as an indication that the 2.5% albumin solution may still be adequate.

Since the previous report, two papers have been published and presentations were made before the following:

1. San Antonio Surgical Society
2. San Antonio Anesthesia Society
3. Gary P. Wratten Symposium
4. Society of Medical Technicians
5. American Medical Association
6. The Society for the Study of Liver Disease

This study will continue for at least a total of twenty patients prior to further reporting. Man hours (total) for the past six months applied to this study are approximately 350, one half off duty. (9416W - 350 hrs; 175 off duty).

Klebanoff, G. Infectious hepatitis complicated by coma: Principles of management including the adjunctive use of asanguineous hypothermic total body perfusion resuscitation. Resusc . I: A: 327, 1972.

Klebanoff, G. Total Body Washout for liver coma. Contemp Surg 2: 13, 1973.

S-18 (72) "Preliminary studies on the development of a life support system functional under conditions of reduced metabolic load: Phase I: Short-term preservation of the whole canine.

Considerable progress has been made in this study. The system design and initial utilization has been accomplished with the following tangible results:

1. A total organism support structure incorporating synchronous and non-synchronous pulsatile perfusion, bubble and membrane oxygenation, full temperature monitoring and control has been constructed.

2. Perfusate composition has been adjusted.

3. Four animals have been studies.

a) The first animal was successfully resuscitated after 6 hours of asanguineous pulsatile perfusion, but died of insulin overdosage. This animal was instructive in identifying the defects of the perfusate for period of the study.

b) The second and third animals died as a result of technical difficulties relating to (1) the pulsatile pump synchronizers when used for the first time and (2) an inadequate arterial cannula.

c) The fourth animal has been perfused for six hours, using a bubble oxygenator and has recovered from the procedure with an apparently completely normal functional recovery.

We have intentionally moved the study to 6-hour segments, since preliminary studies on cardiac arrest being done in the lab suggested that successful preservation for six hours is more than likely possible. Having satisfied ourselves that this is in fact true, we plan to complete the study at the six hour limits as the first phase. The study is presently about half complete and a publishable report should be possible prior to the end of the calender year. Each study consumes approximately 40 hours of the investigator's time in the acute phase; 18 hours on-duty, 22 hours off-duty