CRITICAL EVALUATION OF THE EMERGENCY SERVICES IN THE CHILDREN'S HOSPITAL AIN SHAMS UNIVERSITY WITH SPECIAL REFERENCE TO POISONING

Thesis Submitted For Partial
Fulfilment of Master Degree of Pediatrics

By

NEFERTITI HELMY EL-SEBAIE
M.B.B.Ch

SUPERVISED BY

Prof. Dr. AHMED SAMY KHALIFA
Professor of Pediatrics
Ain Shams University Hospitals
Faculty of Medicine

Prof. Dr. BAHIRA AIY FAHIM
Director of Poison Control Center
Professor of Toxicology
Ain Shams University Hospitals
Faculty of Medicine

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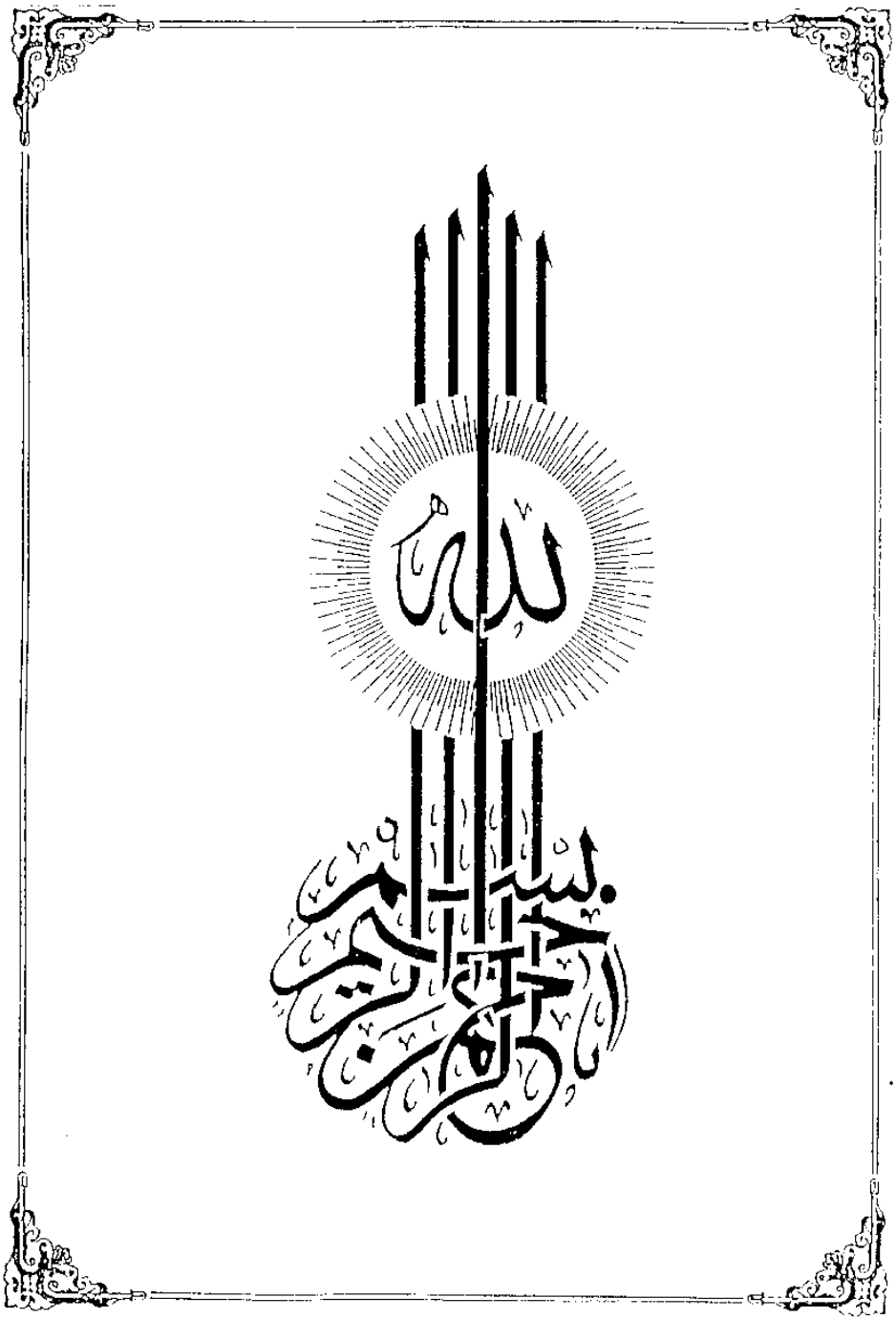

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AIM OF THE WORK

with acute poisoning cases, and comparing them with standard recommendations. Facilities include: structure, equipment general and specific medications, personnel, protocols of treatment, and recording system.

REVIEW OF LITERATURE

STANDARD REQUIREMENTS OF EMERGENCY ROOM STRUCTURE

One of the most important periods affecting a patient's survival and degree of disability is that time immediately following the accidents (Putsep, 1979). The most important function of an accident and emergency service is to provide urgent treatment for those in need of skilled hospital care 24 hours a day (Davison, 1983). Emergency medical care, in the late seventies, has reached a high level of sophistication throughout many developed countries (Gazzaniga, 1979), so that all patients in need will receive the most appropriate care in the prehospital i.e. transportation, intrahospital, critical care, and rehabilitative phases.

Planning of an emergency room (E.R.) should include several considerations:

Location and Design:

Easy accessibility on ground floor level with clear identification of entrances is an essential feature of the E.R. (Steichen, 1979). It should be easily accessible to vehicular traffic and the

directional signs to it should be unmistakably marked and clearly visible day and night. E.R. should have ready access to blood bank, x-ray, laboratories, intensive care unit, operation department, and record department. A waiting area is required for the E.R. patients to be the passage way to the patients' examination and treatment area. Exceptionally this area can be used as a "Triage area". A separate waiting area for accompanying children should be provided (Putsep, 1979).

Fig. (1) shows the "ideal" E.R. (after Steichen, 1979). This includes facilities for care of the severely injured as well as the acutely ill patient, since the immediate care and the intensive diagnostic work-up are similar in both groups. A combined facility will make for a more rational use of resources but is not a must. In this plan, for instance, a line drawn down the middle would produce two equivalent facilities.

It was found that only 2-5% of all E.R. patients suffer from life-threatening conditions, and another 15-20% have true emergency problems (Steichen, 1979). This is especially true in children where the dividing line between what is acute and what is not, often is

difficult to define, and so a clinic in the close viscinity of the E.R. will be needed to reserve E.R. facilities for emergency cases. Also in a study of patients attending an accident and emergency department (A & E) by Davison (1983) in the East End of London, 39% of cases were found to be not accidents or emergencies. Misuse of A & E department could often be ascribed to the patients who are lacking health education and frequently use A & E department as an alternative to general practice. However, inadequacies in hospital and general practice also contributed to misuse of A & E departments (Davison, 1983).

Therefore, to avoid overcrowding or misuse of E.Rs., and in order to reserve all of the needed human and material resources for the care of the acutely ill child, it is advised by Steichen (1979) that there should be "triage" of the pediatric patient in a more leisurely fashion in a "walk-in-clinic". This is a special facility adjacent to the E.R., separately staffed and equipped, and open for instance, from 9 A.M. to midnight.

Administration office:

Administration office of about 15 meter square size should be located immediately adjacent to the entrance, where admissions, discharges, future appointments, and record keeping, are carried out. It has to be manned on a 24-hour basis (Putsep, 1979).

Space:

E.R. must be designed to handle peak loads. A daily patient load of "100" patients requires about 1000 meter square. (Putsep, 1979). A large, unobstructed, well illuminated space is mostly advantageous, particularly when several critically-ill patients are received at the same time, and constant observation is required. Beds and equipment should be moved about easily. Space for resuscitation or gas machines is needed. Several persons may have to attend the patient and work simultaneously, so access to the patient must be possible from all sides. The open emergency treatment room should not be smaller than 7 by 13.5 m. (Putsep, 1979).

Children are sensitive to space and their response to it is strongly emotional. This psychological aspect of the child must be considered as a factor not

least in planning units where pediatric patients are waiting or in an other way medically treated (Weisz, 1976).

Equipment and Supplies:

Regarding equipment needs of the E.R., it is obvious that all instruments for resuscitation in children should be available in sizes adapted to the various ages. (Steichen, 1979). Equipment for E.R. should include examination and treatment table, bed, mobile stretcher, laboratory table, suction apparatus and resuscitator. All the equipment including E.C.G. and medication for comprehensive cardiac care should be kept in the resuscitation room i.e. the part of the E.R. where the patient is to be stabilized. Oxygen outlets, suction machines, and adjustable lamps should always be available. On the wall at each bed, electric outlets, sphygmomanometers, and running water are needed. (Putsep, 1979).

According to Smith (1977), respiratory equipment that should be available include oropharyngeal airways, AMBU ventilating bag, various sized face masks for infants and children, standard portable suction machines, oxygen tanks or wall oxygen outlets, and

sterile plastic suction catheters. Supplies include: sterile needles and syringes including intracardiac needles, plastic intravenous catheters, scalp vein needles, tongue blades, intravenous connection tubing with and without blood filter, three-way stopcocks and alcohol sponges. All the equipment and supplies necessary for resuscitation must be maintained and checked each shift for completeness (Smith, 1977). A running inventory should be kept, instantaneously replacing equipment as it is used, with absolute interdiction of removal of anything for use in other areas of the hospital (Steichen, 1979).

Nurses station should include cabinets above and below for storage of drugs, intravenous fluids, and other medical materials. A refrigerator is needed for biologicals and specimens. All cabinets and shelves must be clearly marked to show their contents. A shower-bath room with floor drains of about 13 m^2 size is needed for children who on arrival need to be cleaned and washed before the treatment can be started. A wash basin for head cleaning, a soap dispenser, a paper towel container, and a container for used towels, are required (Putsep, 1979).

Therapeutics:

There are no absolute criteria for the definition of an emergency or for whether a patient's symptoms justify an urgent interference, but it was found that there was good agreement amongst the casualty officers about the types of cases they classified as "emergencies" (Davison, 1983). It is reported that the most frequent indications for drug therapy in pediatric E.R., are acute infectious processes (Bottenfield, 1979). The remainder of patients who require immediate therapeutic intervention with pharmacologic agents includes infants and children with convulsive disorders, acute asthmatic attacks, poisoning, cardiac arrhythmias, angioneurotic edema, and anaphylaxis. Accordingly, drugs that are used most frequently in pediatric E.R. for the treatment of common acute, and frequently critical diagnostic entities, are listed below:

* Antiasthmatic:

  Epinephrine - Theophylline - Isoproterenol - Isoetharine.

* Anticonvulsant:

  Diazepam - Phenobarbitone - Paraldehyde.

- Antiarrhythmic:

  Digoxin - Procainamide - Methoxamine - Lidocaine.

- Treatment of acute allergic phenomena:

  Diphenhydramine - Hydroxyzin - Epinephrine.

- Treatment of acute poisoning:

  Ipecac - Naloxone - Physostigmine - Diphenhydramine.

Hospitals and clinics wishing to provide for emergency treatment of common forms of poisoning should have all drugs and supplies listed in Tables (1) and (2) available for immediate use (Arena, 1979). The use of potent pharmacologic agents in the E.R. must be monitored carefully with notation of time of administration and total dose administered to avoid the accidental administration of excessive doses to young children with acute critical medical conditions (Bottenfield, 1979). It is worthy to note that acute poisoning from iatrogenic causes due to over-enthusiastic treatment of an emergency, was recorded in 1.5% of poisoning cases in children (Fahim et al, 1983). It is therefore recommended that large charts, readable from afar, that feature dosages of the most frequently used drugs for various ages and weight levels, should be placed on the walls of the E.R. (Steichen, 1979).