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Special Article

Innovations in Burn Treatment in Thailand

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Abstract **The author relates the beginning of systematic and specialized burn care in Thailand, first established at Siriraj Hospital. He emphasizes the innovative nature of burn care during the first few decades of establishing the Burn Unit. Shortages of medical supplies and high costs were behind many of the author's innovations, these included early fluid resuscitation, burn wound management, topical antiseptics and wound dressing, nutritional management and formulae, as well a philosophy of burn care. The story ends with a plea for a competent and ethical approach to burn management.**

Background

Morbidity and mortality of burn patients in Thailand are similar to those in other developing Asian countries. In the past, most burn patients in Thailand were seen by plastic surgeons or their associates. Innovations in burn treatment at Siriraj Hospital started after the completion of my surgical training in general surgery, and after becoming a Fellow in vascular surgery and burns in the United States.

Materials & Methods

In January 1973 I started working in burn care with zero experience. Decades before, most burn patients were seen by plastic surgeons. After the Division of Traumatology was established at the Faculty of Medicine, Siriraj Hospital, late in 1972, I returned from the United States and joined this Division with a few staff surgeons. At that time there was no burn unit in the new Trauma building. Since I was the only one who knew how to care for burn patients admitted to

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the Division of Traumatology, I had to see both trauma and burn patients. I started to treat a case of severe burn in a two-bedroom with the help from nurses from the Trauma ward. I continued to treat severely burned patients for six years before obtaining an opportunity to work at "the first Burn Unit in Thailand" which was opened in 1978. The Burn Unit was built on the top floor of the Trauma building and was composed of 8 to 12 beds. Male and female patients were divided into two separate, large rooms, and one single-bed room was set up as an ICU for severely burned patients. There was one non-functioning operating room. Not very long after that, I had to restructure the rooms in the Unit into an isolated single-bedroom in order to accommodate six to eight patients at the same time. The financial donations from the patients' relatives were used for the reconstruction. Each year more than 100 severely burned patients were admitted to this Unit. This provided me with greater opportunities to see more burn cases and carry out better clinical research studies. In 2009 a brand new Burn Unit with well-equipped isolated rooms with six to eight beds was opened.

My philosophy in caring for burn patients has been - "Good beginning makes a good ending", and "Treat patients like they are a part of your family". In caring for burn patients it is important to consider cost-effectiveness, safety, efficacy and sufficiency, and above all practicing with medical ethics in mind.

My approaches to better burn care include:

1) Maintaining a clear and clean Burn Unit environment.

2) For emergency care of every severely burned patient after arrival at the ER and after assessing the patient using the "ABCD" principle: using hypertonic saline solution (Na 200 mEq/L) for the first 8 hours after burn injury followed by crystalloid solution (RL: Na 130 mEq/L) for the next 16 hours after injury. Adequate hourly urine output for the first 48 hours after injury is very important.

3) Using early endotracheal intubation in patients with associated inhalation injury as well, for severely burned patients who received large amounts of loading fluid in the early burn phase [usually seen in severe burns, over 50% or 60%of body surface area (BSA)].

4) Performing early escharotomy with or without fasciotomy for deep contractive burns.

5) Performing early excision of eschar either by tangential or deep fascial excision. Small deep burns can be treated with immediate skin grafting.

6) Providing early enteral feeding after achieving hemodynamic stability.

A common topical antimicrobial agent used in severe burn wounds is "1% silver zinc sulfadiazine" (modified from 1% silver sulfadiazine). For the last decade nanocrystalline silver has been used more and more frequently. Systemic antibiotics are not routinely given to severe burns. It is used only in patients with sufficient or definitive indications.

In 1973 I was the first person who brought the "amnion" for use in burn dressing (biologic dressing) in Thailand, achieving dramatic results for superficial burns. In 1978 I innovated the "burn diet" prepared as a blenderized diet composed of eight eggs per litre, with adult patients requiring two litres per day. In 1985 I also innovated the "immune-enhancing diet" for burn, trauma and critically ill patients.

Most burn experts accept that early eschar excision with early enteral feeding will provide the best outcome for patients. At present, Versajet hydrosurgery is the most advanced equipment for burn wound debridement. Immune-enhancing diet administered to the patient through nasogastric tubes as enteral feeding is most suitable for those critically ill.

In the past, in addition to the care of complex burn patients, individual groups providing nursing care might advocate different ways of treating patients. This problem occupied my thoughts, and led me to find the methods to get these people to act the same way and aim at the same destination. This was the reason that made me establish four societies of related professionals, such as the Society of Parenteral and Enteral Nutrition of Thailand (SPENT) in 1985, as well the Parenteral and Enteral Nutrition Society of Asia (PENSA) in 1995. I also founded the Thai Society of Burn Injury in 1990, and the Thai Society of Wound Healing in 2006.

Establishing these societies would bring related professionals who have been working in the same or similar medical fields together, comprising a multidisciplinary approach, and should lead them to the same destination. Their meetings should foster updated knowledge and provide a forum for exchanges of ideas, as well as to learn about new advanced

equipments. This is crucial for successful practice and should benefit burn patients.

Results

The time from the initial examination of severely burned patients to their admission to the Unit was limited by space availability. The first Burn Unit in Thailand was set up at Siriraj Hospital in 1978, with 8 to 12 beds. My clinical research studies were carried out along with what I did for these patients. About 50%, more or less, of our admitted burn patients was referred to our Unit after the first 24 hours of burn injury. Overall mortality rate was around 10%, and higher in referred cases. In patients with deep burns the mortality was less than 20%. Early eschar excision with immediate skin graft could be done in these cases. However, in severe and extensive burns of over 50% BSA, treatment was conservative and skin coverage was performed well after the growth of granulation tissues.

Discussion

In the past, due to our shortage of medical products, we had to create or innovate something for our patients, such as enteral diet formulas and parenteral nutrition. Burn treatment four decades ago was very different from that of the last one and a half decades, in which we have more efficient topical wound dressing, better enteral diet formula, and better equipment for wound debridement. Also, skin substitutes are available as well as better environment in the "well-equipped burn unit". After the good outcomes and superior burn care facilities at Siriraj Hospital Burn Unit were recognized, more burn units have since been established. Currently there are 18 burn units in different regions of the country.

Conclusion

Most severe burns should be seen by experts. Morbidity and mortality rates usually vary according to the capability of the caregiver,the doctors and the nurses. Good burn care usually begins with the first physician who saw the patient. The best way to a better care of burn patients is to set up a "burn team" with a surgeon as the leader. The leader must possess good knowledge and experience in burn care. He or she should be a nice and kind hearted person. The outcome of treatment depends on the capability (knowledge and experience) of the responding doctors and nurses. Cost-effectiveness, safety, and sufficiency as well as medical ethics should be in the mind of every surgeon or related personnel treating burn patients.

REFERENCE

Most of references are derived from my own research work and written papers which are available in my curriculum vitae or upon request. I can be contacted on my mobile phone: +668 1854 9512 or e-mail: chomchark@gmail.com .