Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/burns

Merits and challenges in the development of a dedicated burn service at a regional hospital in South Africa

Nikki L. Allorto *, *Damian L. Clarke*

Department of Surgery, Pietermaritzburg Metropolitan Complex, University of Kwa-Zulu Natal, South Africa

ARTICLE INFO

Article history:
Accepted 28 July 2014

Keywords:
Burn
Developing world

ABSTRACT

Introduction: The Edendale Hospital Burn Service was initiated in 2011 to improve the quality of burn care at a regional hospital. This audit reviews the merits and challenges in developing such a service and identifies areas on which to focus quality improvement initiatives.
Methodology: The burn admission records were retrospectively interrogated for the years 2012–2013.
Results: This audit covers an 18-month period in which 490 patients were admitted. Admitted days per percentage burn were 2.6 days per percentage total body surface area burnt. The mortality rate was 13%. Fourteen percent of patients met the criteria for referral to the provincial burn centre but for a variety of logistical reasons only 3% were transferred.
Conclusion: We have redesigned the process of care without alteration of resources. Outcomes of burns less than 30% total body surface area are not acceptable which we believe reflects the lack of infrastructure and systems development. This audit has revealed a number of areas, which are suitable for dedicated quality improvement initiatives.

1. Introduction

We know that burns are common in South Africa and affect the vulnerable sector of our population [1–3]. It is estimated that 3.2% of the South African population is burnt annually, 90% of those are minor burns but 0.2% (270 people per month) sustain a burn that needs specialised burn care and half of those need intensive care. Burns are the most common external cause of death in children less than 4 years old and mortality from burns in South Africa is 8.5 in 100 000 compared to the world average of 5 in 100 000 [4–6]. Many South African authors have described this high burden of injury [11–13] however little has been done to address the training of surgeons in the field of burns or towards the development of a sustainable and practical system of burn care. Burns are predominantly treated by general surgeons in Kwa-Zulu Natal, largely due to the greater number of general surgeons compared to plastic surgeons. Although expected to manage burns, there is not adequate training during registrar or fellowship years. Rotation through a burn unit or centre is not compulsory for trainees and the majority of qualified general surgeons have not had exposure to burn management. A single 1-hour seminar every two years on the management of burns is the only formal burn teaching in the surgical curriculum [3]. Even subspecialist trauma training has limited exposure to burn care. This results in a paucity of burn specialists and general surgeons with the appropriate skills to manage burns.

* *Corresponding author*. Tel.: +27 836557660; fax: +27 314670545.
E-mail address: nikkiallorto@gmail.com (N.L. Allorto).
http://dx.doi.org/10.1016/j.burns.2014.07.021

There is consensus in the developed world as to the definitions and levels of care for burn facilities, units and centres. A burn facility has burn beds that are in a shared environment with other surgical pathologies, has access to an operating theatre and onsite access to other services like paediatrics, radiology, pathology and a transfusion service. A burn unit treats burns of moderate severity, usually defined as percentage total body surface area (TBSA) between 15% and 40%, in a dedicated ward where children and adults are separated, with a temperature controlled theatre and provision of isolation cubicles. In addition psychological care as well as registered nurses with specific burn competencies are included in the standard of care for a burn unit. A burn centre includes all of the criteria for a burn unit and in addition has critical care services and should be associated with a trauma centre. The burn centre should manage severe burns that include large total body surface area (TBSA) burns, inhalation injuries and those requiring critical care. There is no formal systems approach to burns in South Africa. Resources such as burn units or centres are rare.

This audit attempts to document the impact of restructuring the process of care in a single hospital on patient outcomes and to identify areas that are amenable to targeted quality improvement initiatives without the alteration of the resources or inputs.

2. Setting

Pietermaritzburg is the capital of Kwa Zulu Natal (KZN) Province and is the largest city in the western part of the province with a population of 1 001 000 people. Western KZN is a predominantly rural province with a population of two million people, and consists of four health districts. Edendale Hospital is a regional hospital and part of the Pietermaritzburg metropolitan complex that includes a tertiary hospital and a district hospital. There are 900 beds to service general surgery, obstetrics, internal medicine, paediatrics and orthopaedic disciplines. The trauma service admits 150 patients per month [7] and 27 burn patients (15% of trauma admissions) with an additional burden of acute general surgical and elective cases. After hours there are 2 registrars and 2 interns on call to cover all general surgical emergencies including burns and trauma. The adult intensive care unit (ICU) has 6 ventilated and 3 high care beds. It is a closed unit receiving 93 referrals per month on average and 45 admissions. The paediatric ICU is also a closed unit having 5 beds and 25 admissions on average per month. Sixteen paediatric beds and 106 adults beds are allocated to general surgery. The burn ward has 8 beds that are interchangeable between adults and children. These beds are in 2 sections of 40 m^2. There is no dedicated dressing room and only 1 registered nurse on duty per shift. We frequently have up to 45 admitted patients at a time, particularly in winter, and utilise surgical beds in the main ward to accommodate these patients.

3. Systems

In Kwa Zulu Natal only one institution fulfils the criteria for a burn centre. All other hospitals managing burns only meet the requirements for a burn facility despite the expectation to treat burns of moderate and major severity. Edendale Hospital is colloquially referred to as a burn unit and this reputation is almost certainly due to the development of a dedicated multi-disciplinary team who manage all burn patients despite the lack of appropriate resources and infrastructure.

Previously the general surgical service was responsible for management of burns [1,8]. Burn admissions were distributed among surgical firms managing a variety of surgical pathologies from appendicitis to breast cancer. Lack of motivation and limited theatre time led to a pervasive philosophy of wound bed preparation followed by delayed skin grafting resulting in prolonged hospital stays and although unquantified at the time, serious morbidity. Significant benefits to burned patients have been demonstrated in our country by improving burn care capability [9,10]. In response to this the Edendale Burn Service was instituted with the objective of providing a dedicated service for the improvement of this neglected field by changing process of care only.

4. Restructuring the process of care

A number of processes of care were restructured to develop the Edendale burn service. A senior medical officer was employed to managed the burn service with part-time support from two specialist surgeons, one of whom is a registered trauma surgeon and the other completing sub-specialist training in critical care. A junior medical officer, a rotating general surgical registrar and an intern complete the team. The burns team manages all acute burns that are admitted during working-hours. After-hours the on call general surgical registrar is responsible for all burn admissions. The burn service has two theatre slates per week. The theatre is not temperature regulated. A dedicated anaesthetic registrar is assigned to the team on a quarterly basis with specialist support for every operating list. There is a weekly outpatient clinic for follow up visits. Edendale Hospital has no intensive care unit dedicated for burn care and patients with thermal injury requiring organ support, compete with trauma, medical, general surgery and obstetric patients for intensive care admission. Patients requiring complex plastic and reconstructive surgery are referred the tertiary hospital in Pietermaritzburg. Major acute burns are referred to the Albert Luthuli Burn Centre in Durban once they have been appropriately resuscitated. The criteria for transfer to the Burn Centre are a burn of total body surface area (TBSA) over 35%; full thickness burns in special areas, children under one year old with full thickness burns and all children with full thickness burns of more than 5% TBSA, inhalation injury and need for intensive care.

A multi-disciplinary team meeting is held every Monday afternoon and attended by the anaesthetist, dietician, occupational therapist, physiotherapist, nursing staff and surgical burn team. Each admitted patient is discussed in terms of progress and holistic needs and the operative plan for each patient is defined. Unexpected deaths and expected deaths are discussed in this forum as both a quality improvement structure and a means of debriefing. Mortality and morbidity is also discussed monthly in the general surgical forum, as all