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A prospective study of drug prescribing pattern of burns patients in surgery department

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Abstract

Background: To study and describe the present prescribing pattern in burns patients in Rajah Muthiah Medical College Hospital.

Methods: The study carried out was a prospective observational study. The study sample consists of 60 patients diagnosed with burn injury during the time period from January 16 to July 16. Demographic data and other therapeutic regimen were collected from the surgical department of Raja Muthiah Medical College Hospital. The data collected was analysed using Microsoft excel office.

Results: The more number of patients were observed in the age group of 0-20, a total of 452 drugs were prescribed with an average of 7.5 drugs per prescription. The main type of medication includes antimicrobials, analgesics and intravenous fluid. Among antimicrobials, cefotaxime was most commonly prescribed followed by amikacin and amoxicillin + clavulanic acid. Only 18% patients were immunized against tetanus, and the duration of hospital stay also varies with regard to total body surface area of burn.

Conclusions: Children's are more vulnerable to the burn injuries. Polypharmacy was observed in every prescription. Tetanus immunization is important in burns patients to prevent further complications. Results of the present study indicate that some aspects of drug treatment need to be rationalized and also mutual co-operation with the patients and health care professionals is necessary to achieve a better patient care.

Keywords: Prospective study, drug prescribing pattern, burns patients, surgery department

1. Introduction

Burns are also a major problem in the developing world. Over two million burn injuries are thought to occur each year in India (population 500 million), but this may be a substantial underestimate. Mortality in the developing world is much higher than in the developed world [1]. Burns are the fourth most common type of trauma worldwide, following traffic accidents, falls, and interpersonal violence. Approximately 90 percent of burns occur in low to middle income countries, regions that generally lack the necessary infrastructure to reduce the incidence and severity of burn [2].

A burn is defined as an injury to the skin or other organic tissue caused by thermal trauma. It occurs when some or all of the cells in the skin or other tissues are destroyed by hot liquids (scalds), hot solids (contact burns), or flames (flame burns). Injuries to the skin or other organic tissues due to radiation, radioactivity, electricity, friction or contact with chemicals are also considered as burns. Burns may be distinguished and classified by their mechanism or cause, the degree or depth of the burn, the area of body surface that is burned, the region or part of the body affected, as well as the extent [3].

Most burns are due to flame injuries. Burns due to scalds are the next most common. The most infrequent burns are those caused by electrocution and chemical injuries. The type of burns suffered is related to the type of patient injured. It is therefore useful to break down burn aetiology by patient groups as this reveals the varying causes of injury. In most groups there is a male predominance. The only exception is in elderly people, among whom more women are injured because of the preponderance of women in that population [4].

1.1 Older children and adolescents: 10% of burns happen to children between the ages of 5 and 14. Teenagers are often injured from illicit activities involving accelerants, such as petrol, or electrocution.

1.2 Working age: Most burns (> 60%) occur in patients aged 15-64. These are mainly due to flame burns, and up to a third is due to work related incidents.

1.3 Elderly people: Some 10% of burns occur in people aged over 65. Various effects of ageing (such as immobility, slowed reactions, and decreased dexterity) mean elderly people are at risk from scalds, contact burns, and flame burns.

1.4 Compromising factors: Burn victims' health is often compromised by some other factor, such as alcoholism, epilepsy, or chronic psychiatric or medical illness. All such problems need to be addressed when managing patients in order to speed recovery and prevent repetition of injury. The fact that 90% of burn injuries are preventable has led to many attempts to decrease their incidence. These attempts fall into two main categories-education and legislation. Education is an “active” process that requires a change in an individual's behaviour. Legislation is “passive” and is independent of a person's actions. Both have advantages and disadvantages.

1.5 Education: The most successful campaigns have targeted specific burn aetiologies or populations. A good example of this is the campaign to reduce chip pan fires in Britain during the late 1970s. This led to a 30% reduction in the incidence of burns due to chip pan fires. The main problem with educational prevention is that it relies on changing the way individuals behave. This means the message must be repeated regularly, as shown by the UK government launching a second chip pan fire campaign in 1999. However, a successful educational campaign has an instantaneous and widespread impact.

The treatment of burns depends on the depth, area and location of the burn. Burn depth is generally categorized as first, second or third degree. A first degree burn is superficial and has similar characteristics to a typical sun burn. The skin is red in colour and sensation is intact. In fact, it is usually somewhat painful. Second degree burns look similar to the first degree burns; however, the damage is now severe enough to cause blistering of the skin and the pain is usually somewhat more intense. In third degree burns the damage has progressed to the point of skin death. The skin is white and without sensation [5].

2. Methodology

This is a prospective observational study conducted at the In-patient department of surgery, RMMCH, Chidambaram. The study was conducted from January 16 to July 16.

Table 2: Percentage TBSA (total body surface area) of burn with outcome of the patients.

Percentage TBSA burned	Number of patients	Number of discharged patients	Number of patient undergoes death	Number of referred patients	Number of patients DAMA
01-20	27	25	0	0	2
20-40	21	20	0	0	1
40-60	9	6	2	1	0
Above 60	3	1	1	0	1
Total	60	52	3	1	4

Patient’s case sheet was used for data collection. A total of 60 patient details were collected which include Patients name, age, sex, and date of admission and the percentage burnt surface area. Other data collected was the type of drug prescribed (name, frequency of dosing, route of administration, and duration of therapy), adverse effect, average number of drugs per prescription, the percentages of drugs prescribed in generic names. The treatment received in burns patients was classified into pharmacological classes such as antibiotics, analgesics, antacids, multivitamins, sedatives, tetanus prophylaxis and others (if any) used.

3. Selection criteria of patients

3.1 Inclusion Criteria

The patient who got admitted in surgery ward
All patients who are scheduled for surgical procedure with no previous injury or infection in the area being operated

3.2 Exclusion Criteria

Patient with chronic renal disease.
Patient who has any preoperative infectious disease at the time of admission.

4. Results

A total number of 60 patients were admitted during a period of seven months from Jan 2016 to July 2016 and these patients were randomly selected and included in this study. In the study most of the patients were found to be within the age group of 10-20 years. From our sample size of 60 patients, 25 were females and 35 were males [TABLE 1].

Table 1: Demographic profile of the patient

Age group (years)	Males	Females	Total (%)
01-10	5	3	8
10-20	8	6	14
21-30	7	4	11
31-40	6	3	9
41-50	5	2	7
61-70	3	4	7
Above70	1	3	4
Total	35	25	60

Out of 60 cases evaluated in our study 43 cases was due to thermal burns, in that 28 patients were the victim of flame, 2 of liquid substance and 1 of gas.6 patients were admitted due to chemical burn and 11 patients were the victim of electrical burn. We found that patients involving burn surface area in the range of 0-20, 21-40, 41-60, above 60 percent were 27, 21, 09, and 03 respectively. Out of the 60 patients, 52 were discharged, 3 died, 1 were referred to higher centre for further treatment and 4 patients were DAMA (Discharged against Medical Advice) [Table 2]. Majority of the deaths occurred in patients with more percent burned surface area.

A total of 452 drugs were prescribed with an average of 7.5 drugs per patient, with range 5-12 drugs per prescription. After analysing the prescriptions it was found that every patient was prescribed with one or more antibiotics (30.13%), analgesics (15.2%) and antiulcer Drugs(13.1%) while prescriptions containing tetanus toxoid injections were 11(2.4%) and that of IV fluids were 56(27%) [TABLE 3].

Table 3: Category of drug prescribed

Drug category	Number of prescription	Number of drugs	Percentage
Antibiotics	60	138	30.13%
Analgesics	49	69	15.2%
Vitamin supplement	29	53	11.7%
Antiulcer	41	59	13.1%
I.V fluid	56	122	27%
Tetanus toxoid	11	11	2.43%

Most of the patients were discharged from the hospital within 1-3 days; there is a fluctuation of patient hospital stay according to the TBSA. Out of 60 patients 21 were admitted for 1-3 days, 14 for 3-6days, 10 patients for 6-9days and 13 patients had their course in the hospital for more than 9 days [TABLE 4].

Table 4: Degree of burn and duration of hospital stay

TBSA of burn	1-3 days	2-6 days	6-9 days	Above 9
0-20	13	7	5	2
21-40	9	5	4	3
41-60	0	1	1	7
Above 60	1	1	0	1
Total no patient	21	14	10	13

5. Discussion

Globally, burns are a serious public health problem. An estimated 265,000 deaths occur each year from fires alone, with more deaths from scalds, electrical burns, and other forms of burns, for which global data are not available. In high-income countries, much has been done to lower the burden of burn injury. Among the list of burn prevention strategies that have been developed and implemented are smoke detectors, regulation of hot water heater temperatures, flame resistant children's sleepwear, and housing codes that assure safety of electrical wiring. The effectiveness of such interventions varies, but in many cases, notable successes have been recorded [6].

Parallel developments in burn care have also contributed to the lowering of burn related mortality and morbidity in high-income countries. Recent advances in burn care have included improved capabilities for the resuscitation of burn victims, better care of burn wounds (through techniques such as skin grafting), improved infection control and more effective rehabilitation programmes. Burn survivor groups have also played an important role, not only by providing much needed peer support but also through their campaigning and advocacy efforts, in particular, in relation to burn prevention and treatment. In addition, they have been instrumental in gaining legal protection for burn survivors from discrimination in the workplace and society [7].

Correct management requires a skilled multidisciplinary approach that addresses all the problems facing a burn patient. Appropriate drug utilization studies are needed for

evaluating proper utilization of drugs for efficacy, safety, convenience and economic aspects. In the present study we tried to evaluate the prescriptions and to know the various drug groups currently used in burns patients in our setup [8]. From the study we can conclude that, the most common age group affected was the adolescent age group 10-20 years. This pattern shows the increasing impact of society, peer pressure on the growing youth. Out of 60 patients, 25 were females and 35 were male. This observation did not comply with the study carried out by Palak Agrawal *et al.*

In the present study, the average number of drugs per prescription was 7.5 with a range of 5-13 drugs per prescription. This observation is higher than that of the study by palak agarwal *et al.* and also higher than the previous study reported by Santoshkumar R. Jeevangi *et al* [9]. Which was 4. Out of 60 patients in the study, 52 were discharged, 4 were DAMA (Discharged against Medical Advice), 3 died and 1 were referred to higher centre for further treatment. Out of 60 patients, 27 suffered 0-20 % TBSA burned followed by 21 patients who suffered 21-40% TBSA burned. Majority of the deaths occurred in more than 50% burns. The mortality was less than that reported by Palak Agrawal [10] *et al.*, and also less than that as of padwal SL *et al* [11].

The increasing risk of infection in burn victims can be attributed as one of the leading cause of morbidity and mortality and remains one of the most challenging concerns for the burns team. The most common drug class prescribed in the study was antibiotics (30.13%) followed by anti-ulcer drugs (13.1%). Every patient was prescribed with a minimum of one antibiotic in their therapeutic regimen i.e. antibiotics were prescribed in 100% of prescriptions which is similar to a study conducted by Palak Agrawal *et al* [10]. And Padwal SL *et al* [11]. While prescribing antibiotics the emerging resistance should be kept in mind.

Most of the patients in our study received combination therapy with two or three types of antibiotics. Most common antimicrobial prescribed in combination was Cefotaxime + Gentamicin, Ciprofloxacin + Amikacin, Cefotaxime + Amikacin, Ceftriaxone + Erythromycin, Piperacillin-tazobactam+ Ceftriaxone. Combination therapy offer many advantages like treatment of polymicrobial infections, prevention of emergence of bacterial resistance and also act in synergism. On the other hand, it also increases expenses, risk of adverse effects and chances of super infection. A Cochrane review on antibiotic prophylaxis for preventing burn wound infection found that systemic antibiotic prophylaxis had no effect on burn wound infection rates in non-surgical patients, and that preoperative systemic antibiotic prophylaxis had no effect on any of the review outcomes, thus the role of prophylactic antibiotic use in burns patient is controversial [12].

Burn pain is the most difficult form of acute pain to treat for any type of etiology. The Pain lasts much longer than expected than the actual problem, untreated pain can prevent sleep and may lead to problem of depression. In the present study, 82 percentages of patients were receiving different analgesics which include diclofenac sodium and paracetamol followed by ibuprofen, aceclofenac and tramadol. Opioids were prescribed in severe burns pain while diclofenac sodium and paracetamol were prescribed in mild to moderate burns. Frequent and continuous evaluation of the patient response is very important due to various stages that the hospitalized burn patient goes through, as

well as a combinational therapy of analgesic and non-pharmacological treatment.

In case of tetanus prone wounds patient should receive a booster and or tetanus immune globulin because small wound may lead to fatal tetanus in patients with inadequate immunity. A special care should be given to any wound or burn sustained more than 6 hours or any wound or burn at any interval after injury that shows one or more of significant degree of devitalised tissue and puncture type wound. In the present study out of 60 patients only 11(18.3%) patients were immunized against the tetanus this observation is fairly similar to the previously conducted study of Agrawal P *et al.*

It is a widely accepted fact that severe fluid loss is the greatest problem faced following major burn injuries. Therefore effective fluid resuscitation is one of the cornerstones of modern burn treatment in the present study; IV fluids were prescribed in 94% of prescriptions. Majority of the patients were prescribed RL (Ringer Lactate) and NS (Normal Saline) and dextrose normal saline.

Thus it may conclude that, in the present study, drug prescribed for burn care management was according to the standard treatment guidelines, but on the other hand more patients and health care professionals co-operation is needed to achieve better treatment outcome and our study also indicate that some aspects of treatment should be rationalized.

6. Conclusion

Burns are among the leading causes of disability-adjusted life years (DALYs) lost in low and middle income countries, aetiology burns consists of several reason. From overly hot faucets to tipped-over coffee cups, burns are potential hazard in every home. In facts, burns (especially scalds from hot water and liquids) are some of the most common childhood accidents. Babies and young children are especially at risk because they have curious, small, and have sensitive skin that needs extra protection

Though existing therapeutic treatment regimen offers advances care for burn injuries, burns remain among the most common injuries presenting to emergency departments, and they continue to result in significant morbidity and mortality in the community.

From the study we can conclude those males are prone to burn injuries when compared to females. More number of patients was found to be between the age group 10-20, which is the adolescent and growing youth. This reflects the impact of society on the growing generation. When we consider the prescriptions, the number of drugs is high paving path for toxicity, drug-drug interactions, adverse drug reactions, non-adherence, emerging resistance and lastly the cost of treatment on the patient. While prescribing for burn patient the care giver should keep these in mind. The number of patients who received tetanus immunization is less this can lead to complications thus aggravating the present condition of the patient, thus immunization is important for burn victims. Antibiotics are a powerful weapon which is like a two-headed sword which can serve both ways. While prescribing antibiotics we should keep in mind the emerging resistance and should rely on the sensitivity test whenever possible.

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