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Burns among older persons: A narrative review

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ABSTRACT

Background: The older adult population has been noted to be increasing at a steady rate and they have been described as persons at a high risk of being involved in burns. Thus, attention towards trauma among older adults is on the rise and there is a need to understand the characteristics of the injury among this population group.

Methods: A narrative review approach was utilised for the study. PubMed, ScienceDirect and Google Scholar were used as search engines to identify studies that focused on burns in older adults or discussed some aspects related to the phenomenon from January 2000 to January 2017.

Results: In all, thirty one (31) articles were retrieved. The terms "older adult" and "elderly" was noted to exist in literature with varying age limits. Older persons were noted to form a substantial number of persons affected by burns with flame burn identified as the major type of burns affecting older adults. However, scald burns were recognised to be higher among older females than males. Majority of these injuries were noted to occur within the domestic settings and associated with cooking. The presence of co-morbid factors was reported in most studies with hypertension and diabetes recorded as the commonest. The existence of dementia was noted to be associated with severe burns and double length of hospital stay. Outcomes of the injury included varying mortality rates, worsening of existing premorbid conditions, respiratory complications such as pneumonia and longer hospital stay. The use of a frailty scoring system was noted to offer better outcome prediction as compared to only the chronological age. One study noted that females experienced longer hospitalisation periods as compared to elderly males even though their burns were smaller.

Conclusion: Older persons are affected by burns and resources required to meet their needs may be higher due to their longer periods of hospitalisation. The domestic nature of their injuries provides a window of opportunity to design preventive strategies. Also, policies and strategies are needed to protect the well-being of older persons. Further studies are needed to clearly understand gender differences associated with burns as this can impact management strategies. Follow up strategies after discharge need to be considered to understand the outcomes overtime. Also, more prospective studies and randomised control trials are needed in understanding the effectiveness of various interventions used in the clinical management of older persons.

1. Introduction

Burn injury has been described as a common traumatic injury which causes significant mortality and morbidity [1]. The occurrence of burn injury is not specific to any population or age group as they can affect any person. Despite this, the older adult population has been indicated to be a high risk group of being involved in burns. The occurrence of burn injury among the older persons has been attributed to decreasing physical strength, impaired protective mechanism, poor vision, existence of multiple co-morbidities and decreased reaction time [2]. Some occurrence of burns among the older adult population has been attributed to abuse and neglect [2]. Though older persons are a high risk group, there is generally limited exploration of the characteristics such as incidence of burn injury among them as well as outcomes of the injury. However as the older adult population is expected to increase [3], there is an interest in understanding the epidemiology and outcomes among them as these may provide useful insights into the phenomenon. Thus, this narrative review seeks to explore

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the incidence, aetiology and outcomes of burns among older adults.

2. Materials and methods

This review aimed to include all studies from January 2000 to January 2017 reporting on aetiology, incidence and outcome of burns among older persons. Language restrictions were set to cover articles reported in English. PubMed, ScienceDirect and Google Scholar were used as the search engines. The PubMed search included automatic and manual search strategies with the following MeSH terms: "older adult burns", "burns", "burn epidemiology", "burn outcomes", "incidence", "burn causes" and "burns in elderly persons". This yielded a total of 10,111 results. Additional filters were added and this included age, full text or abstract availability in English and species (human). Furthermore in ScienceDirect and Google Scholar, more elaborate combinations such as "outcomes of burns among older adults", "incidence of burns among older adults", "cause of burns among the elderly" and "outcomes of burns among the elderly" were used. No initial definition for the term "older adult" and "elderly" was provided as each paper added to this review had its unique definition of the term. The studies included were retrospective studies, prospective studies, systematic reviews, literature reviews and trial studies. This resulted in 45 articles. After the search, duplicates, case reports and editorials were removed. Also, studies that did not report the epidemiology or outcomes of burns among older adults were excluded. Thus, only studies that focused solely on older persons or reported features focusing on incidence, aetiology or outcomes specific to older adults were included. Overall, thirty one (31) articles met the inclusion criteria and were included in the review. The initial search was undertaken by JB. Selection of articles was undertaken by JB and AEB independently and compared the outcomes together to reach a consensus (see Table 1).

3. Results

3.1. Discussion

3.1.1. Definition of the terms "older adult" and "elderly"

Older adults have been noted to be a category of persons also prone to burns of varying degrees. The process of ageing may be associated with several physiological changes which result in diminished functional reserves and decreased ability to adapt to burn trauma [26]. The growing number of older adults and their susceptibility to injuries makes them important consumers of burns and trauma care [4]. As the older adult population is expected to rise, there is a need to understand the incidence of burns as well as outcomes of these injuries as they can aid in designing preventive measures. However in the first instance, there is need to understand what the term "older adult" and "elderly" means.

The term "older adult" appears to be loosely defined in literature [6]. For instance in the paper by Duke et al. [22], older adults included in their study were aged 45 years and above. In other studies, it was defined as those aged 55 years and above [9,10,13]. Furthermore, the term "older adult" was defined as those aged 60 years and above [12,15]. However, in the study by Taylor et al. [17], the term "seniors" was used to refer to persons aged 60 years and over. Also in the studies by Yin et al. [31] and Davies et al. [29], the term "elderly" was defined as persons aged 60 years and over. In addition to the above, other papers presented in this review have defined the term "elderly" as those aged 65 years and over [2,4,5,21,23]. One study that was undertaken at the Victorian Adult Burn Service, Melbourne, however defined the term "elderly" as those aged 70 years and above [7]. These notwithstanding it appears the term "older adult" represents persons aged between 45 years and 55 years whilst persons aged 60 years and over characterises the term "elderly" or "seniors".

Peck [1] has argued that the term "elderly" is a commonly used synonym for "aged" though this is not listed in the Medical Subject Headings (MeSH) as a distinct term. Peck [1] further notes that on the basis of numeric approach, the term "elderly" defines a person aged between 65 to 79 years which is in line with some studies presented here [2,4,5,21,23]. The World Health Organisation [34] has noted that most developed countries have accepted the chronological age of 65 years as a definition of the term "elderly" or "older person". However it has been argued that this definition does not adapt well the situation in Africa and as such 50 years and above is accepted as the general definition of an older person [34]. Despite these challenges in accepting a uniform term, Peck [1] has argued that from a medical perspective, persons in this age group may have variable fitness level and as such there may be a need to consider the general condition and social situation of the patient rather than following a strict age limit [1]. In similar lines, Masud et al. [32] have proposed the use of an elderly person's biological age or global pre-morbid state rather than chronological age assess the elderly burnt patient. Thus in their study, the frailty scoring system devised through the Canadian Study of Health and Ageing was utilised which revealed differences between elderly burned patients who died and those who survived ($p = 0.0001$; Mann–Whitney U test = 78). This suggests that elderly burned patients with better pre-morbid capacity were more likely to survive. The study by Romanowski et al. [33] provides further support for this assertion as they noted that non surviving elderly burned patients had higher frailty scores as compared to those who survived. Also, those who were discharged home had lower frailty scores as compared to those who were discharged to skilled nursing facilities. These findings may indicate that in predicting outcomes of burns among burn older adults, there is a need to consider frailty scores rather than chronological age and in defining an older person, researchers may need to be cognizant of these scores in predicting outcomes rather than an all fit all chronological age [45]. The findings by Pham et al. [13] further corroborate this assertion as they observed the importance of comorbidities over chronological age in pneumonia development among older adults. These indicate the limited benefit of considering only the chronological age in predicting outcomes in burn older persons. These findings may specify the usefulness of the frailty scoring system which can be adapted and used as an adjunct in assessing outcomes of burns in the older adult population [32].

3.1.2. Incidence of burns among older persons

The studies presented in this paper affirm that older adults are also affected by burns and clinical management remains a challenge [35]. The studies included in this review reported various levels of burn injury prevalence among older persons. Chang et al. [4] observed that older persons aged 65 years and above formed 8.5 per cent (94) out of the 1110 patients admitted with burns. Using the same age limits, Rao et al. [5] noted in their study that sought to analyse aetiology and outcomes of burns among elderly that 63 participants were observed to older than 65 years. Pham et al. [10] also observed that from 1991 to 2005, older adults with burns formed 14 per cent (23, 180) of the total 180, 401 burned patients admitted. Pham et al. [13] further identified that from 1995 to 2007, older adults formed 8.6 per cent (23,794) of the total number admitted with burns. However, in both studies the definition for older adult was specified as those aged 55 years and above though both featured data from multiple centres (USA and Canada). In another multi-centre study (Australia and New Zealand, Moore et al. [15] noted that from 2005 to 2011, persons

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