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Paediatric burns epidemiology during COVID-19 pandemic and 'stay home' era



Sir,

The COVID-19 pandemic has led to significant changes to society. It has changed the way people behave and how healthcare is provided. In our study, we seek to evaluate the impact of the pandemic on the epidemiology of burns in the paediatric population.

Government-implemented lockdown measures and school closures have led to reduced outdoor activities and lifestyle changes. Our regional Paediatric Burns Centre introduced a new standard operating protocol involving a new phone consultation pathway, a secure email platform for effective communication with parents and tertiary referring hospitals. The aim is to reduce physical attendance to hospital where possible, streamline our referral service, avoid unnecessary admissions and empower parents where appropriate.

We performed a retrospective comparison over five weeks in which the government imposed lockdown instructions from 23/3/2020 to 30/04/2020 (lockdown period) and compared it to a similar period from a year ago 23/03/2019 to 30/04/2019 (control period).

During this period, the total attendance to our Emergency Department (ED) has decreased by 60% in the lockdown period (7127 versus 2936), as expected due to the national advice to avoid unnecessary visits to hospital. The incidence of burn injuries reported was instead greater in proportion — 2.8% of all ED attendances, compared to 1.5% in the previous year, despite the overall decrease in total number of burn injuries ($n=83$) by 24%. This could be due to a combination of the closure of some local and minor injury facilities, reduced face-to-face consultations with general practitioners and the advice given to the general public that even minor burn injuries still require medical attention for adequate treatment. This instruction is crucial for the well-known potentially life-threatening complications of burns in children [1]. Concerns were raised by the Royal College of Paediatrics and Child Health that children may be coming to harm from delayed presentation to emergency departments for fears of contracting COVID-19 in hospital. In our cohort of burns patients, only 2 were deemed to have come to harm by delaying presentation.

We also noted that the number of referrals to children social care increased from 4% (5/123) in the control period to 12% (12/95) in the lockdown period. The reduced opportunity to liaise with allied health professionals and education settings to share information and concerns and to finally agree on a plan for follow up might have been due to a more vigilant approach for the fear of missing child protection concerns.

The mean age of patients presenting with burns increased from 2.9 to 4.8 years. School-age children are now spending more time at home due to school closures, and UK statistics have suggested that most burns happen at home [2]. Gender distribution is similar in both periods.

The number of inpatients in our centre decreased by 37%. All patients required COVID-19 testing prior to admission to

the ward. During the study period, we did not have any patients who tested positive for COVID-19.

We observed that incidentally more patients were admitted with greater total body surface area (TBSA) burns. During the lockdown period, half of our admissions sustained greater than 5% TBSA burns, with 29% greater than 10% TBSA. In our control period, 95% of all admissions sustained a burn equal or lesser than 5% TBSA. The duration of stay has also halved, with length of stay/TBSA (LOS/TBSA) being 0.42 during the lockdown period compared to 1.04 in the control period. This suggests that we are managing bigger burns as outpatients in the lockdown period.

Scald injuries remain the commonest cause of paediatric burn injuries (85% in the lockdown period, 68% in the control period). Recently, our centre observed a surge in scalds directly resulting from the practice of steam inhalation during the COVID-19 pandemic, as an unprescribed method to prevent and treat infection [3].

Forty-one patients were followed up as outpatients in lockdown compared to 48 patients in the control period. Only 39% of patients had to physically attend for clinical review, opposed to 100% in the control period. The introduction of a new teleconsultation system is helping empower parents to look after their children who have sustained burn injuries, which also reduces the need for physical attendance.

At present, it is not yet possible to ascertain the impact of the pandemic on the long-term outlook of paediatric burn injuries. Continual effort and research into the subject is essential for us to better comprehend the lasting effects of this new phenomenon, to plan our services and protect the wellbeing of children.

Declarations of interest

None.

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REFERENCES

- [1] Young AE, Thornton KL. Toxic shock syndrome in burns: diagnosis and management. *Arch Dis Child Educ Pract* 2007;92: ep97–ep100.
- [2] Children's Burns Trust. Burns database. <https://www.cbtrust.org.uk/burn-prevention/database>. [Accessed 23 May 2020].
- [3] Brewster CT, Choong J, Thomas C, Wilson D, Moiemien N. Steam inhalation and paediatric burns during the COVID-19

Early acute kidney injury in severe burns



To the Editor,

We have read with interest the manuscript entitled "Clinical characteristics and risk factors for severe burns complicated by early acute kidney injury" published by Chen et al. in Burns [1].

This is an important study that uses the KDIGO criteria for diagnosis and stratification of AKI in burn patients which is an advance to unify criteria. It is also important to differentiate between the early AKI and late AKI. Early is usually secondary to initial aggression and inadequate management of fluid resuscitation therapy, the delay in performing escharectomies and other factors. Late AKI is usually secondary to sepsis, nephrotoxic drugs and other complications. Traditionally, AKI is considered "early AKI" when it occurs in the first three days after the burn and "late AKI" when it occurs later.

These authors found that TBSA%, full-thickness TBSA%, ABSI and rhabdomyolysis were the risk factors that influence the incidence and severity of early AKI in severely burned patients.

We had previously conducted two studies on 165 severely burned patients. In the first we found that TBSA% and severity scores were significantly different when we compared all patients with AKI (early and late) to those without AKI [2]. In the second we also studied the characteristics of the patients who developed early and late AKI and found that 12 (7.2 %) patients developed early AKI (stage I: 7, II: 1 and III: 4). Out of all of them, 4 recovered the baseline situation before day 7, although 2 subsequently developed a late AKI. Of the other 8 patients: 3 continued in AKIN stage I at 7th day, 1 increase to

AKIN II and 4 to AKIN III [3]. Like in the study by Chen et al., we found that Early AKI patients had more TBSA% and worse severity burn scores. Although in our case they did not have statistical significance, perhaps due to the low incidence in our study. There were no differences in volume contributions, nor in the need for mechanical ventilation, nor during the first 3 days in SOFA score, extravascular lung water or intraabdominal pressure.

Moreover, we have now reviewed the data from these patients and we have found that 2 patients (1.2%) developed AKI between days 4 and 7. These patients were classified as late AKI, but their causes were probably the same as those of early AKI, which makes us think that the 3-day limit may be too short.

Therefore, the severity factors in the burned patient are almost the same as the risk factors of early AKI. However, the ABSI score data they present is not the usually used. In the abbreviated burn severity index (ABSI) the maximum value cannot exceed 18 and, in their data, they showed median ABSI of 43. Therefore, the authors must explain the parameters included in the score which was used in order to interpret the data.

In the critically ill patient, fluid contributions have been related to the incidence of AKI and the need for renal replacement therapy [4]. Adequate fluid therapy can prevent the development of AKI and for this reason a suitable monitoring is necessary [5]. However, in this study they have only reflected the resuscitation formula, but not the actual fluid requirements. So, it is not possible to find relationships between fluid intake and early AKI. Perhaps the low incidence