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Editorial

Ocular trauma – are we doing enough?

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Ocular trauma has far-reaching effects on individuals and the wider community. In particular, open globe injuries (OGI) have a high risk of blindness, resulting in potentially devastating impacts on an individual's mobility, ability to work and independence. Despite calls for public health measures and ongoing interest within our profession in optimising outcomes following OGI, the question remains, are we doing enough to minimise the incidence and improving outcomes of ocular trauma?

In the current issue of Clinical and Experimental Ophthalmology, Lee *et al* describe the epidemiology, clinical characteristics, prognostic factors and economic costs of a series of 155 surgically managed OGI at Westmead Hospital in Sydney, Australia.[1] They report an incidence of 1.41 per 100,000 person-years, which reflects a global trend of decreasing incidence of OGI.[2-4] Young males are at highest risk of OGI, supporting similar findings from other studies.[2,4,5] Occupation-related injuries account for over a third of all injuries, with younger adult males making up 96.3% of this subgroup.[1] 89.1% of work-related OGI occur in the setting of inadequate protective eyewear, a statistic of particular concern given that the majority of these injuries are preventable.[6]

Public health measures can be effective in reducing ocular injuries. Legislation limiting personal use of fireworks has decreased firework related injuries by 87%.[7] Dorman *et al* have also recently reported a reduction in OGI following implementation of a strategy to reduce alcohol consumption in Far North Queensland in Australia.[8] As Lee *et al* state in their discussion, in many countries, general public health measures such as mandatory wearing of seat belts in vehicles have reduced morbidity and mortality rates. With the known risk of occupation-related OGI, can measures be improved to protect employees in workplaces from injuries? In countries including the USA and Australia, penalties apply for employers who do not provide a working environment (including personal protective equipment) that is safe and without risk to health. Habits learnt in the workplace often, but not always, transfer to the home environment where OGIs also frequently occur. Careful education on protective eyewear for employees and employers is therefore essential.

Sports and recreation activities are the setting for OGI in 17% of cases Lee *et al*'s series. Interestingly, the use of protective eyewear is mostly not mandated in the sporting environment. Squash Australia has made it compulsory for junior players, doubles players, and coaches to wear protective eyewear whilst on the squash court. However, adult singles players can opt out. This raises the question of whether it should be mandatory for all players, irrespective of age? Identification of sports most at risk of OGI should be examined to determine if mandatory eye protection should be recommended where appropriate, much like protective equipment is mandatory in the National Football League in the USA.

Of equal concern, falls in older patients are highlighted as an important cause of OGI. While falls only account for 15% of cases in Lee *et al*'s series, in a separate study, 67% of OGI following a fall led to blindness.[9] Should there be campaigns encouraging the elderly to have their vision checked akin to childhood vision screening programs? Should all patients presenting with falls have their vision assessed? As ophthalmologists, we have a duty to our patients to inform our patients and their carers about risks of falls if they have a visual impairment.

We also need to consider how we can improve our surgical care of OGI. Evidence supports expeditious repair to reduce the risk of endophthalmitis, especially in the setting of dirty wounds, lens capsule breach, and intraocular foreign bodies.[10] Areas of uncertainty in OGI management include the indications for early vitrectomy for zone 2 and 3 OGI, and the precise timing of extraction of a traumatic cataract. Such surgical decisions are commonly made on a case-by-case basis. Our profession would benefit from focussed study in these areas to better guide practice.

One of the main barriers in researching OGI has been the clinical heterogeneity of injuries, which makes well designed, prospective studies challenging. Much of OGI research is based on retrospective studies with relatively small numbers, as an adequate sample size to explore a study question is difficult to achieve without multiple centres over an extended study period. Thus, eye trauma registries are

considered a crucial method of collecting large quantities of data to improve OGI management. The landmark United States Eye Injury Registry (USEIR) was established in 1988, deepening our understanding of ocular trauma and forming the basis for the Birmingham Eye Trauma Terminology system and the Ocular Trauma Score,[11,12] which are utilised in Lee *et al*'s study. However, the USEIR became inactive in 2013 and has not been replaced with a new registry in the United States. Other ocular trauma databases or registries have been established in other countries including Hungary, Mexico, Italy and Canada, although there are limited publications and not all appear to be currently active. The Cuban Ocular Trauma Registry[13] found that hammering on metal contributed to 39% of injuries, and final BCVA was below 6/60 in 49% of patients.

More recently, the International Globe and Adnexal Trauma Epidemiology Study (IGATES) has been established as a collaborative effort between the Asia Pacific Ophthalmic Trauma Society, International Society of Ocular Trauma, Chinese Ocular Trauma Society and Ocular Trauma Society of India.[14] As a multi-national registry, it will be a key step in improving our understanding of OGI. National and international ocular trauma societies are also being established to promote recognition and research into OGI. An editorial by Chen *et al*[15] challenge the recently founded American Society of Ocular Trauma to re-establish a United States based ocular trauma registry.

Finally, the importance of adequate training in the surgical repair of OGI cannot be understated. Experience in surgical repair is often limited, especially amongst trainees and ophthalmologists who work in locations with a low incidence of OGI. There is also a negative impact from modern sutureless surgical techniques on our suturing experience and hence competence in OGI repair. Some of the shortfalls in training may be addressed by the global trend towards competency-based medical education. From 2022, the Royal Australian and New Zealand College of Ophthalmologists are stipulating a minimum number of surgical procedures, including the repair of OGI, required by trainees prior to completion of their training program. However, amongst the many ophthalmology fellowships available around

the world, there are no dedicated ocular trauma fellowships. Thus, adequate skills must be developed and maintained through wet lab training, attending courses, and through the transfer of surgical skills from other anterior segment procedures. Ongoing efforts to ensure that operating surgeons who are involved with OGI repair maintain appropriate expertise will go a long way to optimising long-term outcomes for our patients.

As a profession, we can and should do more in preventing OGI in the community, by lobbying lawmakers and organisations to identify and mandate preventative strategies, and by participating in training and research into OGI so that we can continue to reduce the individual and societal impact of this devastating entity.

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