Architectural glass injuries: a case for effective prevention

Ousby & Wilson (1982), among others, highlighted the potential severity of glass injuries and pointed out that these injuries can be prevented resulting in savings for the Health Service as well as reducing morbidity and mortality suffered by the victims. Jackson (1981) was one of the first to show by analysing the children victims of glass injuries that architectural glass (ordinary glass used in dwellings) caused more severe injuries than any other type of glass.

We have compared the severity of injuries sustained by patients of all age groups caused by architectural and non-architectural glass and reviewed the existing measures of prevention.

There were 918 patients who attended the Accident and Emergency (A&E) Department of the Royal Victoria Infirmary during the year of 1985 as a result of glass related injuries. During the same period the total number of patients treated for all accidental injuries was 34,473. Glass related injuries, therefore, were 2.7% of all accidental injuries. The demographic and clinical data obtained from patient records were coded and analysed in the Newcastle University main frame AMDHAL computer using the SPSSX package for social sciences.

Out of 918 patients, 366 (40%) received injuries caused by architectural glass and 552 (60%) by non-architectural glass. The mean age was 23.9 and 23.7 years respectively for the two types of injury. There was significant ($P = 0.0004$) male predominance in the architectural glass injuries (M:F = 3:1). While architectural glass injuries were more often sustained at home, public places were the most frequent place of injury caused by other types of glass. Upper arm and forearm were more frequently affected in the architectural group, while distal lower limb was the commonest site of non-architectural glass injuries.

Architectural glass was found to cause more severe injuries involving muscle and tendon, nerves and blood vessels and the wounds were multiple in a significantly higher proportion of patients.

Patients sustaining injuries from architectural glass required hospital admission more frequently. They also needed a greater number of local anaesthetic/nerve blocks for complicated plastic/surgical reconstructive procedures. Total treatment time was longer with architectural glass injuries with more frequent out-patient reviews and disability from scarring, motor and sensory deficit.

Architectural glass is ordinary or annealed glass normally used in dwellings. When subjected to sufficient impact force (depending on the thickness of glass) it breaks into a number of jagged, dagger-shaped fragments, some of which are retained in the frame,
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and inflict severe damage to the deeper structures producing occasional fatalities (Jackson, 1981).

Architectural glass injuries have a long history. The first reported fatality was more than 100 years ago (Hashemi & Subhedar, 1986) but health care professionals became concerned about the glass in buildings during the 1960s and 1970s. This led to a large study in the USA (Hazard Analysis, 1974) and subsequent federal legislation enforcing the use of ‘safety glass’ in 1977 (Consumer Product Safety Commission, 1981). As a result there was virtual abolition of serious architectural glass injuries. Safety glass is safe by virtue of the fact that it either breaks into small, harmless fragments (toughened glass), resists breakage or breaks but remains contained (laminated glass), thereby reducing the risk of lacerations (Sinnott, 1987). By encouraging the use of safety glass in place of architectural glass Lawson & Irwin (1980) reported similar reduction of severe injuries in Australia.

In the UK the code of practice for glazing in buildings has always been voluntary. Although there has been tightening of the code (such as the latest, BS6262), this has not produced the desired results. According to HASS (Home Accident Surveillance System) the number of architectural glass injuries has increased from 16,000 in 1979 (Clark & Webber, 1982) to 33,000 in 1984 (Tomalin, 1985). Various recommended preventive measures such as (i) health education, (ii) alteration of behavioural and personal factors, (iii) improved product design and (iv) planning of space, (Clark & Webber, 1982) have had only a marginal effect.

Our findings reinforce those of Jackson (1981) that architectural glass injuries are more severe occurring mainly in the young age group and result in significant morbidity and financial cost to the patient, the family and the health service. There is a move to improve glass safety standards and incorporate these into new building regulations in the UK but this is likely to take a few years to come into force (Sinnott, 1987). Accident and emergency physicians and surgeons have a special interest in the prevention of injuries and the maintenance of environmental safety. We suggest that further and larger prospective studies be undertaken to confirm our conclusions that architectural glass produces serious injuries in all age groups. The mounting evidence of these studies are most likely to expedite the adoption of legislation enforcing the use of safety glass in buildings, the only effective means of prevention (Jackson, 1981; Sinnott, 1987).

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REFERENCES

