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Clinical Topics

Lacerations from glass in childhood

R H JACKSON

Abstract

A study of 62 glass injuries to children serious enough to warrant admission to hospital showed that 30 were due to architectural glass in doors or windows and 26 of these occurred in houses. Glass bottles caused 12 injuries. Architectural glass produced more serious injuries affecting major arteries, nerves and tendons, and internal viscera.

In view of the frequency and severity of architectural glass injuries in houses, safety glass is recommended for all glass doors, French windows, patio doors, and the lower parts of windows.

Introduction

Lacerations from glass are an important cause of injury in childhood; many of them are severe and some are preventable. A study has therefore been made of the circumstances of the accident and the position of the glass concerned; and lacerations to arteries, nerves, and tendons from all causes have been analysed to find out the proportion caused by glass.

Patients and methods

Data were available on 80 children known to me in the eight years, 1973-80, all except three being admitted to the Royal Victoria Infirmary, Newcastle. Relatively minor lacerations were not included; "soft tissue lacerations" imply that no artery, nerve, or tendon had been cut. Some children cut more than one structure and the most important component has been used, so that each child appears only once in the "main injury" figures. "Subsidiary injury" indicates children who had other injuries in addition to the main injury. Some injuries are more important than others, and lacerations have therefore been classified as "major" if they occurred in structures above the wrist or ankle joints and "minor" if hands or feet were affected.

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Results

Sixty-two (80%) children had injuries from glass and 18 from other causes. There were no striking differences in sex or age between the two groups. In the whole series boys outnumbered girls, as in other types of accident, but this was more pronounced than usual—65:15. Older children were most commonly affected, with a peak in the 5-9 age group, compared with toddlers in most accidents in the home.

By far the largest group of injuries (30) were caused by "architectural" glass in doors (fig 1) and windows (fig 2) (table I), compared with bottles (fig 3) and drinking glasses (16), and miscellaneous or unspecified types of glass (16). Architectural glass had been installed in houses in 26 cases, and in a public building or school in two cases each.

TABLE I—*Architectural glass injuries*

	Doors		Windows	
	Main injury	Subsidiary injury	Main injury	Subsidiary injury
Arteries				
Major	4	—	4	—
Minor	1	—	—	—
Nerves				
Major	3	2	1	4
Minor	—	1	—	—
Tendons				
Major	2	3	2	3
Minor	—	2	—	—
Visceral	3	—	—	—
Soft tissue	9	—	1	—
Total	22	8	8	7

Injuries produced by other types of glass, such as pieces of broken flat glass in play areas, glass in a guinea-pig hutch, etc, and by bottles and glasses (table II) were less serious than injuries in which the glass was fixed in a door or window, though children walking or running with bottles form a clear-cut group, some of which had serious

injuries. Records did not always state the type of bottle, but four injuries were caused by milk bottles and three by lemonade or similar bottles.

FIG 1—Boy's face after falling through a glass door.

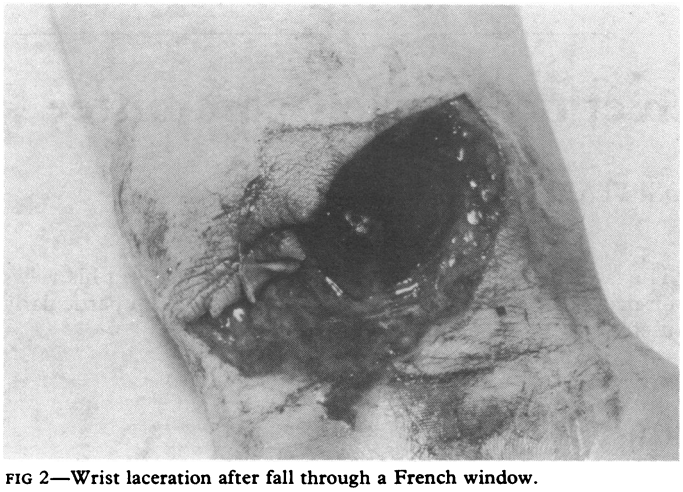

FIG 2—Wrist laceration after fall through a French window.

TABLE II—*Other glass injuries*

	Other flat glass		Bottles and drinking glasses		Other glass unspecified or unknown	
	Main injury	Subsidiary injury	Main injury	Subsidiary injury	Main injury	Subsidiary injury
Arteries						
Major	—	—	2	—	—	—
Minor	—	—	2	1	—	—
Nerves						
Major	2	—	2	1	3	—
Minor	—	—	5	2	2	—
Tendons						
Major	1	—	2	2	2	1
Minor	1	—	—	5	—	1
Visceral	—	—	—	1	—	—
Soft tissue	—	—	3	—	5	—
Total	4	—	16	12	12	2

"Other or unspecified glass" included those children who required delayed suture of nerves, and three children with glass splinters which required surgical removal, as well as falls on pieces of broken glass, the type of which was not clear. Three children sustained their injuries while playing in derelict houses—a recognised source of danger—and two injuries occurred at school.

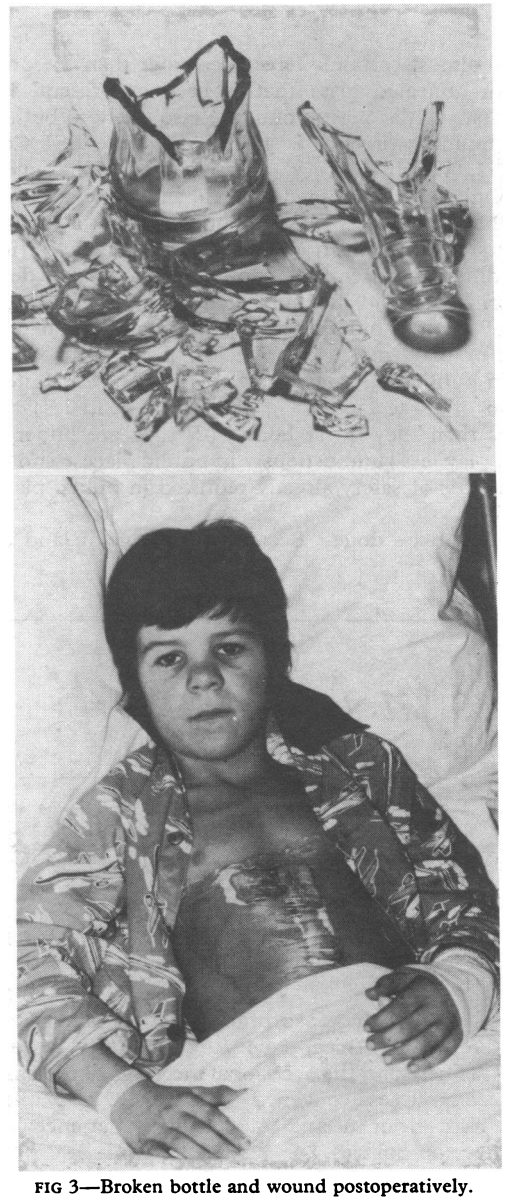

FIG 3—Broken bottle and wound postoperatively.

Discussion

The most striking feature of this series is the large number and serious nature of the injuries caused by architectural glass,[1] which was responsible in 30 out of 62 injuries, including that of a child who died. They were more likely to affect the trunk and proximal parts of the limbs; eight of the 10 major arterial injuries, all three visceral injuries, and four of the nine main nerve and tendon injuries were from architectural glass.

The use of glass in buildings has increased in the past few years,[2] and admissions for accidents due to architectural glass have become increasingly frequent (table III).

The most important aspect of these injuries is that they are relatively easy to prevent. If the glass had been safety glass (toughened or laminated) lacerations would almost certainly not have occurred, and wired glass, though not officially a safety

TABLE III—*Annual numbers and types of accidents*

	1973	1974	1975	1976	1977	1978	1979	1980
Architectural glass	0	1	3	3	3	3	13	4
Other glass	1	4	4	1	4	3	7	8
Total No of glass injuries	1	5	7	4	7	6	20	12
Lacerations from other causes	1	0	1	4	1	1	6	4
Total No of accidents	2	5	8	8	8	7	26	16

glass, would almost certainly have been safer than the ordinary patterned or annealed glass that is used at present. Recent developments, such as plastic film, are also likely to be safer.

Current building practice is governed by the BSI Code of Practice 152, which is very unsatisfactory. The allowable thickness of glass is determined by area, and there is no specification for the use of safety glass in houses, except in bathrooms and showers, or in balustrades. The code states, "Juvenile behaviour differs from that of adults, and buildings designed for the former should be subjected to accordingly higher standards of safety," but this appears to assume that children do not live or play in houses. The low proportion of injuries occurring in public buildings or schools may be attributed to a combination of three factors: (1) children spend less time in these places than they do at home; (2) they are under better control and play less rumbustiously in public places; and (3) the higher standards of safety already required in public places are of some value.

What needs to be done? Because people go in and out by doors, movement near doors is likely to be commoner than near windows. A moving 10-year-old boy weighing 30 kg carries much greater kinetic energy than a toddler weighing 15 kg and accounts for the preponderance of injuries in school children. It is totally inadequate to suggest that a push bar or wooden rail at "lock-rail" height gives sufficient protection. The only answer is to use safety glass in all glass doors, whether the glass is full length or above or below lock-rail height. This should apply to French windows and patio doors as well. The danger from windows is mainly from glass in the lower part of full-length windows, and all glass below lock-rail height should be safety glass. If glass above lock-rail height is a separate sheet it can be annealed. The BSI should be strongly urged to implement these recommendations in their current review.

The wider use of plastic or waxed cartons will reduce the risk of injury from bottles and drinking glasses, though the economic complexities of replacing bottles and bottling plants and the recycling of materials will need to be considered.

I am grateful to the Audio-Visual Centre, University of Newcastle upon Tyne, for the photographs.

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Ethics in Medicine

Experience at a clinical research ethical review committee

ETHICAL COMMITTEE, UNIVERSITY COLLEGE HOSPITAL*

Several descriptions of the constitution, functions, and experience of clinical research ethical review committees have been published.[1-3] These and the occasional meetings of the chairmen of ethical committees convened by the Royal College of Physicians have been useful in sharing experience and so helping to develop policies.

The committee on the ethics of clinical investigations of University College Hospital and of the faculty of clinical sciences of University College London, was set up in 1969, and we express some opinions about its functions to provoke discussion.

Membership

There are seven medical members, one of whom is a general practitioner; one nurse; and two lay members, one of whom is a lawyer. The lay members, who have no other associations with our institutions, play a prominent part, and their interaction with the medical and nursing members has been invaluable.

*Members of ethical committee: S L Cohen, physician; C G Clark (vice-chairman), professor of surgery; A L Diamond, director, Institute of Advanced Legal Studies; D A W Edwards, physician; M Engledow, nursing officer; D V I Fairweather, professor of obstetrics and gynaecology; D R Laurence (chairman), professor of pharmacology and therapeutics; M Modell, senior lecturer in general practice; Rt Hon Kenneth Robinson; and J H Wyllie, professor of surgical studies.

The lawyer does not advise solely on legal issues, but his views on matters affecting consent and liability have been particularly useful.

Functions

We have accepted the aims set out by the committee of Northwick Park Hospital and the Clinical Research Centre[2] and their belief that ethical review cannot be separated from scientific quality, but we have not established a scientific advisory group. We are well aware that we cannot judge the scientific quality of all proposals, and we have occasionally used outside advisers or asked an applicant to consult further. Most university and other scientific centres will have the skills available, but many hospitals may not have people with all of the necessary skills for judging all of the projects that come to the ethical committee. Referral to remote advisers is likely to be cumbersome and time consuming but may be essential at times.

Mandatory review

All research projects affecting human subjects must be submitted to our ethical committee. We do not think that