The mortality study does not prove that occupational hazards affect mortality. No excess deaths were noted from infective conditions. Death rates from cancer of the bladder too were lower than those in the general population. Access to lethal chemicals may be construed as an occupational factor leading to high suicide rates. The increased risk of lymphomata in English male pathologists is not explained. The possibility of this being an artefact due to more accurate diagnosis is offset by a failure to show excess deaths in conditions requiring similar diagnostic expertise, such as Hodgkin's disease and leukaemia. A prospective study should be established to obtain a larger study group in order to assess whether the small number noted in this study has contributed to a spurious result. Aortic aneurysm was noted specifically in the study after an anecdotal report of increased incidence²¹ but an observed:expected ratio of 4:1.8 (male pathologists) and 6:3.3 (male technicians) is not explained.

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Contemporary Themes

200 injuries caused by playground equipment

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Summary

Two-hundred children with injuries caused by playground equipment were studied. Whereas only about 9% of the total casualty attendances are for fractures, 26.5% (53) of these children had fractures. The climbing frame and the slide seemed to be associated with more severe injuries than the swing or other equipment, but more cases need to be studied to confirm this. The youngest children were at particular risk on equipment such as the wooden rocking horse or roundabout, when the speed of

operation could be controlled by older children. Many of the injuries to the very youngest children occurred when they were walking behind a moving swing. Faulty equipment did not seem to be a major factor in causing accidents, but the use by older children of apparatus designed for young ones led to accidents. There was supervision, either at home, in a school playground, or in a park, in 62% of the cases. Many of the accidents were the result of the normal desire of children for experimentation and adventure.

Introduction

Numerous articles have been written about childhood accidents, but very little has been written about injuries caused by play equipment. Such injuries were not mentioned in a recent symposium on childhood accidents.¹ Certain dangers connected with swings are mentioned briefly in the excellent booklet by the Portsmouth Junior Chamber of Commerce²; the dangers of rotting of a wood seat and of standing on a seat were noted. The National Association of Ladies' Circles made a report on children's playgrounds.³ This gave more information about the

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equipment than about the accidents that occurred on it. Home playground equipment injuries were investigated in 1973.⁴ Fractures represented 20% of the injuries, and 4% of the 1908 children injured were admitted to hospital. Swings were responsible for 69% of the injuries, slides for 14%, climbing apparatus for 8%, and seesaws for 3%.

Study

Our study was one of 200 children brought to the accident and emergency department of the Children's Hospital, Sheffield, over 18 months in 1974 and 1975 because of injuries sustained while playing on playground equipment. They were not consecutive cases; a detailed proforma had to be completed by the doctor, and at times of undue pressure of work there was not always time to complete it. Incomplete proformas were discarded. Completion of the form did not depend on the severity of the injury. The children were seen by the consultant in charge (CMI) or the other accident and emergency staff, which consisted of two part-time registrars and four senior house officers. The mean age of the children was 6.3 years (range 14 months-13 years). The severity of the injuries was graded as follows: grade 1, trivial, usually no treatment or follow-up necessary; grade 2, minor lacerations, soft tissue injuries, bruises, or undisplaced fractures of phalanges; grade 3, more serious lacerations, undisplaced limb fractures or minimally displaced greenstick fractures, and minor head injuries; grade 4, fractures for which admission was essential, seriously displaced fractures that needed manipulation under a general anaesthetic, and head injuries with concussion or skull fracture, or both; grade 5, potentially life threatening conditions—for example, ruptured viscus or serious head injuries.

The grading was done by the consultant (CMI) and was made when the child's treatment was completed or all the facts about the injuries were known.

General findings

Eighty-four (42%) of the children were girls; 80 (40%) were the youngest in the family, and 48 (24%) were the oldest. Eighty-one per cent of the injuries occurred after midday, 32% in the holidays, and 20% at weekends. Twenty-nine per cent occurred at school, 49% in a park or other playground, and 22% at home. Altogether 86 children had had a total of 147 previous injuries, but it would be difficult to find meaningful controls with whom to make a comparison. There was adult supervision in 62% of the cases (in 26% by a teacher). In 48% of the climbing frame injuries there was teacher supervision.

The table shows the main findings. Three-quarters of the injuries were more or less trivial, but there were fractures in 26.5% of cases. X-ray examinations were carried out in 59.5% of cases. Lacerations, bruises, and abrasions accounted for 56% of the injuries, and 46% of the injuries were above the neck, affecting the face or head. Only 12 children (6%) had concussion or skull fracture, and 20 (10%) children were admitted.

SWINGS

The swing accounted for 61 injuries; and 3 of these were injuries of grade 4 severity, and the children had to be admitted. Thirteen

children had fractures, and three of them had concussion or fracture of the skull. There had been less teacher supervision than in the case of the other equipment injuries, but the three serious accidents all happened when there was an adult supervisor and none of the three children involved had had previous accidents.

How accidents happened—Eighteen children (10 of whom were below the age of 3) were hit by the swing when walking behind it; 17 fell off when sitting on the swing; 10 fell when standing on the swing (one being pushed off when standing on the shoulders of another); 7 fell when jumping off a moving swing; 3 were hit by the swing when pushing it from behind; 2—a 12-year-old and a 13-year-old—fell off swings designed for younger children when the swings collapsed; 1 caught a finger in the chain of the swing; 1 caught his thumb on a child who ran up behind; 1 caught his heel while swinging on a metal rim holding the swing in place, and 1 fell when climbing on the frame of a swing.

Three injuries were serious. A 13-year-old boy was on a swing designed for a small child, and it collapsed and he had an extensive occipital fracture with loss of consciousness. He later had fits. A 3-year-old girl fell off while the swing was being pushed and sustained a large fracture of the parietal bone; she was drowsy and poorly. There was a displaced fracture of the lower leg in a 5-year-old who was pushed off when several children were on a swing together.

CLIMBING FRAMES

The climbing frame accounted for 54 accidents and in six the injuries were assessed as severity grades 4 or 5. Nine children were admitted to hospital. Fourteen children had fractures and six had concussion or fracture of the skull.

How accidents happened—Fifty-one children fell off when climbing on frames, 29 when climbing up; 7 when jumping off; 6 when standing on the top; 5 because they were pushed off; 2 when swinging on bars; 1 when somersaulting on the bars; and 1 when jumping from one bar to another. Two children injured themselves when they ran into the metal frame, and one stood up and caught his head on a metal rung. Six of the injuries were serious and two were potentially life-threatening. A 4-year-old fell from a height of 10-12 feet on to a bar and then to the ground. She was severely shocked and had a ruptured spleen. There were two severe skull fractures in 6- and 7-year-olds and two seriously displaced fractures of the elbow. A leg injury was later complicated by osteitis.

SLIDE

The slide accounted for 39 accidents. Four children had injuries of grade 4 severity, and five were admitted. Fourteen had fractures.

How accidents happened—Thirteen children fell when sliding (2 were pushed off); 5 caught an arm or leg when sliding; 3 were bruised by sliding off the bottom; 2 fell when climbing on, 2 fell off the top (one was pushed off); 2 fell when getting off at the bottom; and 2 cut their hands. One child banged his head when climbing on; one caught his chin when sliding off the bottom; one caught her teeth on a metal bar, one caught his foot when sliding sitting on his mother's knee, one fell when walking down the slide, one fell off the bottom, one lacerated his ear on the foot of the child sliding behind him, one fractured a metacarpal by sitting on her hand while sliding, one got a large splinter in the buttock when sliding and one pushed another child off, fell himself, but clung on by his hand and got a pulled elbow. Four injuries were serious. One was a displaced fracture of the radius

Type of injury in relation to type of playground equipment involved in accident

Play equipment	No cases	Mean age (years)	Age of youngest (years)	Severity of injury (No (%) with each grade)					No (%) with:				No (%) with:		
				1	2	3	4	5	X-ray examination	Fracture	Laceration	Other	Injury above neck	Concussion or fractured skull	Admitted
Swing	61	6	1 year	22 (35.3)	27 (44.3)	9 (14.8)	3 (4.9)		30 (49.2)	13 (21.3)	23 (37.7)	25 (41.0)	41 (67.2)	3 (4.9)	3 (4.9)
Climbing frame	54	5	2 months	17 (31.5)	21 (38.9)	10 (18.5)	4 (7.4)	2 (3.7)	37 (68.5)	14 (25.9)	4 (7.4)	36 (66.7)	28 (51.9)	6 (11.1)	9 (16.7)
Slide	39	6	1 year	8 (20.5)	19 (48.7)	8 (20.5)	4 (10.2)		25 (64.1)	14 (35.9)	8 (20.5)	17 (43.6)	18 (46.2)	1 (2.6)	5 (12.8)
Seesaw, roundabout, others	46	7.2	5 months	21.7 (10 (21.7))	50.0 (23 (50.0))	23.9 (11 (23.9))	4.3 (2 (4.4))		58.6 (27 (58.7))	26.1 (12 (26.1))	21.7 (10 (21.7))	52.2 (24 (52.2))	13.0 (6 (13.0))	4.3 (2 (4.3))	6.5 (3 (6.5))
Total	200	6.3		57 (28.5)	90 (45)	38 (19)	13 (6.5)	2 (1)	119 (59.5)	53 (26.5)	45 (22.5)	102 (51)	92 (46)	12 (6)	20 (10)

and ulna which occurred when a 5-year-old fell over the side of the slide. A 4-year-old girl fractured her femur when she fell off the side of the slide. A boy of 9 came off the end of the slide and then fell backwards. He had a displaced supracondylar fracture of the humerus. The fourth serious injury was a fracture of the occiput, which occurred when a 4-year-old boy was pushed off the side of the slide by older children. A fifth child was admitted because he was found to have a bruise on the forehead and was drowsy. He was aged 4 years and no-one seemed to have been with him or to know what had happened. X-ray examination showed no fracture and he was normal the next day.

ROUNDOABOUT

Fifteen children were injured by roundabouts. Only one had severe injuries (grade 4) and he was admitted. Six of the 15 had fractures.

How accidents happened—Five children fell off a moving roundabout (one when playing "tiggy" on it); 2 fell when getting off while it was moving; two got a foot trapped underneath when trying to stop; one caught his foot when getting on; one got a trapped hand when trying to release a roundabout jammed by a brick; one trapped his hand while collecting stones from underneath it; one injured a foot when he slipped into a hole where a board was missing; one slipped on a pebble and her foot caught under the roundabout, and one fell off when older boys made it go too fast. The one serious case was concussion in a boy of 5 who jumped off a moving roundabout.

OTHER EQUIPMENT

Seesaw—There were seven accidents on seesaws. None were serious but one child was admitted because there might have been loss of consciousness after the fall. One of the seven had a fracture. Three children trapped a hand or foot under the seesaw; two caught a leg when getting off; and two were bounced off by older children.

Rocking horse—Eight accidents occurred on the wooden type of rocking horse designed for several children. There were no serious injuries, but there was one undisplaced fracture of the lower leg. No child was admitted. Three children fell off the rocking horse when it was made to go too quickly by older children who were on it; three bumped their head for the same reason; one was pushed off by an older child; and one trapped a hand when it was going quickly.

Miscellaneous equipment—There were 16 injuries on miscellaneous pieces of equipment and one injury was severe. Two children caught their heads when emerging from a concrete pipe, and one bruised a knee when crawling in. Three children fell or jumped off climbing blocks and a wooden castle (1 had his teeth knocked out). Four children fell or jumped off a vaulting horse and bars (2 had fractures of forearm). There was one fracture among the injuries that were caused by playing on benches or logs: one child fell when doing a cartwheel, one slipped off, and two were pushed off. One child fell off a rope attached to a tree and sustained bilateral severely displaced fractures of the forearms, and one child was injured when he fell from a tyre attached to a rope when the rope snapped.

Discussion

Almost all children suffer some painful accident however good the home and however careful the parents and, later, the teachers. As Dietrich⁵ wrote, complete protection from accidents after the first year or two would only delay the child's development of independence and lead to accident proneness; lack of adequate protection may lead to the same result. Parents have to weigh up the dangers and take calculated risks to help the child to develop independence as children have to learn from their mishaps. But adults, from their greater experience, must foresee danger and protect children from risks that are too great for their level of development. In these 200 accidents in connection with play equipment it is impossible to say how many accidents could have been prevented by wise management. There was some sort of adult supervision in 62% of the cases, and it is doubtful whether further supervision would have been feasible or useful.

To draw meaningful conclusions about the relation of the severity of the accident to the type of play equipment greater numbers would be required. It may surprise some that so many of the injuries (26.5%) were fractures, though many of them were trivial. Fractures make up only about 9% of the total attendance at the paediatric accident and emergency department in Sheffield. The climbing frame and the slide seemed to be associated with more severe accidents than the swing or other equipment, but further study is needed to confirm this. Notably few accidents could be firmly ascribed to faulty equipment, but several occurred when older children were using equipment designed for much younger children.

A high proportion of the children who were injured while walking behind swings were very young ones. Seven were under 2 years old. Younger children were also at risk on equipment like the wooden rocking horses, which could hold several children of differing ages at any one time. If older children made the horse go too fast or jerk suddenly the younger ones fell off or shot forward and hurt their heads. Equipment such as roundabouts, where the initiation of movement or the speed of operation may not be under the control of one child, also exposes the younger children to hazards. Several injuries resulted from feet or hands being caught in the space between the base of the roundabout and the ground.

As would be expected, many accidents were due to normal childhood rashness—walking on top of a climbing frame (or turning somersaults on one), pushing others off a slide or swing, standing on the swing, or even standing on the shoulders of another child on the swing. These activities could hardly have been prevented.

We have tried to record in detail exactly how each accident happened. We felt that this would provide more useful information than a mere statistical study of the number of children attending our accident and emergency department because of mishaps with play equipment.

We thank all the members of the medical staff of the paediatric accident and emergency department at the Children's Hospital, Sheffield, for their help. The Royal Society for the Prevention of Accidents provided some valuable references.

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Have anabolic steroids a place in the treatment of progressive conditions characterised by protein loss and bone wasting such as systemic lupus erythematosus? Can they offset the catabolic effects of large doses of glucocorticoids?

Despite their apparent effect on the halting of bone resorption in osteoporosis,¹ anabolic steroids have proved disappointing in the management of chronic inflammatory disorders in which long-term steroid therapy has accelerated muscle wasting and bone resorption. Reports of the development of hepatocellular carcinomas^{2,3} and of fatal intrahepatic haemorrhages⁴ in patients receiving androgenic-anabolic steroid therapy have recently appeared. While most of these patients were being treated for aplastic anaemia, it seems wise to avoid this form of therapy in other conditions where the beneficial effect may at best be marginal.

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