ORIGINAL ARTICLE

Domestic Accidental Injuries to Children Presenting at a Rural General Practice

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Summary

A survey of domestic childhood accidental injuries was conducted at a rural general practice in Arau, Perlis. Data was collected from parents or other caregivers of 171 children, aged 12 years and below, using a pre-tested questionnaire. Male children between the ages of 6 and 12 years were the most common group affected, with a male to female ratio of 1.7:1. The three most common accidents were injuries from falls (28%), cuts, lacerations,bruises and puncture wounds not resulting from falls (26%), and thermal injuries (22%).The most commonly affected parts of the body were the limbs. Most injuries to children between ages 4 to 12 years occurred in the house compounds, while those to children below 4 years occurred in the kitchen and other locations within the house. Major contributing factors to the injuries were the existence of unsafe home environments, the risk taking activities of the children, the presence of hazardous products in the household and unrealistic parental attitudes to injury prevention.

Key Words: Domestic accidents, Childhood injuries

Introduction

Injuries to children have long been recognised as a major public health issue and injuries from all causes constitute the third leading cause of death and disability in Malaysia[1]. Childhood injury research in Malaysia is fairly recent. The first local hospital based study on domestic accidents by Leila and Robinson involved 1542 children[2]. The study reported that the most common accidents observed were injuries from falls (39%), cuts and bruises (29%), burns and scalds (19%), with a male:female ratio of 1.9:1 and 57% of the injured children aged below four. A higher incidence was observed in children from rural homes and those of Malay ethnicity. Since 1985, there have been numerous local publications on home injuries based mainly on observations in hospital departments, with particular emphasis on burn injuries, poisoning, bicycle injuries and foreign bodies[3,4,5,6,7,8].

The aim of this study was to investigate the patterns of domestic accidental home injuries to children of different age groups in a rural Malaysian community, and to determine the relationship of these injuries to factors relating to the child, family, environment, and type and quality of supervision.

Methods

A total of 171 children aged 12 years and below with accidental home injuries seen at a rural general practice at Arau in Perlis between May 1995 and September 1996 were studied using a questionnaire. "Rural" in the context of this study refers to all areas that lie outside the administrative limits of the town council and fall within the jurisdiction of village administrative committees. The respondents were either the parents or other family members living in the child's household. The injured children were classified into four age groups: 1) 0 - 12 months (infants), 2) > 1 - 4 years (toddlers), 3) > 4 - 6 years (pre-school children), and 4) > 6 - 12 years (primary school children). Only children who had resided in Arau for at least 6 months prior to the injury and who

presented with injuries as the primary presenting complaint were included in the study. Children with suspected non-accidental injuries were excluded. The severity of the injuries were graded into 1) mild 2) moderate and 3) severe based on a scale developed by Alwash and McCarthy 1988[9]. Data analysis was performed using a Statview 4.51 program. Comparisons between categorical variables were made with the chi square test, in which p values <0.05 were considered statistically significant.

Results

Characteristics of the children

The sample consisted of 171 children (108 males and 63 females). Seventy-seven percent of the children were of Malay ethnic origin, with Chinese forming 9%, Indians 8% and Thais 6%. Eighty-two percent of the mothers of the children were married and living together with their husbands. Eighteen percent of the respondents were single parents (divorced, widows, widowers). Thirty-three percent of the mothers and forty-two percent of the fathers had completed secondary school education. Fifty-three percent of the children came from families with monthly incomes in the range of 500-1000 Malaysian Ringgit. The mean family size was 4.5.

Of the total of 171 main injuries recorded, 19 (11%) occurred in the 0-1 year age group, 49 (29%) in the >1-4 year age group, 45 (26%) in the >4-6 year age group and 58 (34%) in children >6-12 years. Males aged >6-12 years constituted 24% of the sample. The male to female ratio was 1.7:1. No significant age and sex differences were observed in relation to injury occurrence. Five children with visual and hearing deficits constituted 3% of the sample.

Time and location of injury occurrence

Sixty-six children (38%) had injuries on Saturdays and Sundays (school weekends). No significant differences were observed in injury numbers between the age groups in relation to the day of injury occurrence. For children in the 4-6 year age group (pre-school children), a highly significant proportion of injuries (44%) occurred between 12 noon and 6 pm, while for those between 6 and 12 years (primary school children), the peak hours of injury were between 6 pm and midnight (chi square $p < 0.01$).

The highest percentage (35%) of injuries occurred in single storey (brick) terrace houses, while 25% occurred in single storey (wooden) houses. Children from the traditional rural double storey wooden houses, had 22% of the injuries seen.

The most common location for injuries was the compound of the house (33%), while the next common location was the kitchen (28%). Statistically, significant differences were observed in the age groups of children in relation to the location of injury occurrence. Most injuries to children aged 4-12 years occurred in the house compound, while those to children below 4 years occurred in the kitchen and

Table I
Total contribution of wounds, falls and thermal injuries to the overall injury pattern in the different age groups

Age groups (years)	Wounds (not due to falls)		Falls		Thermal injuries		TOTAL	
	No.	%	No.	%	No.	%	No.	%
0 - 1	4	21	8	42	5	26	17/19	89
>1 - 4	9	18	16	33	13	27	38/49	78
>4 - 6	11	25	10	22	10	22	31/45	69
>6 -12	21	36	13	22	10	17	44/58	75

other locations within the house (chi square p = 0.007).

Forty-eight children (28%) with injuries had suffered previous injuries at home within six months of the presenting injury. In 11 (23%) of the children, the nature of the previous injury was similar to the presenting injury.

Injury Types

A variety of injuries were seen and included 47 falls, 45 wounds (not resulting from falls), 38 thermal injuries, 15 animal bites, 12 poisonings, 11 foreign body injuries, and 3 electrical injuries. For the purpose of this study, the term 'wounds' refer to cuts, lacerations, bruises and puncture injuries. Injuries from falls, wounds (not resulting from falls) and thermal injuries contributed to 130/171 (75%) of the total number of injuries (see Table I). The most commonly affected parts of the body were the limbs (53%), the upper limbs in 35%, and the lower limbs in 18% of children.

Injuries from falls (28%)

Injuries from falls contributed to 28% of the total number of injuries. Falls from furniture, cradles and staircases were the most common (32% of falls), followed by falls from motorcycles/bicycles (28%), baby walkers (19%), trees (17%), and those due to being dropped by the person carrying the child (4%).

Wounds (not resulting from falls) (26%)

Cuts, lacerations, bruises and puncture injuries were most commonly seen in children above 4 years of age (65%). Cutting objects especially knives were the most common objects causing wounds, (53%) in all age groups. Nail pricks contributed to 58% of puncture wounds.

Thermal Injuries (22%)

The main objects responsible for thermal injuries were hot liquids (18%), and kitchen utensils (18%). Motorcycle exhaust pipe burns constituted 13% of thermal injuries, with 90% of such injuries occurring in the 6-12 years age group. In the 0-1 year age group, 89% of thermal injuries occurred in the kitchen in the presence of the mother or domestic helper. Burning mosquito coils contributed to 11% of thermal injuries, all occurring in the 0-1 year old children.

Animal Bites (9%)

Injuries from animal bites (5 cat bites and 10 dog bites), were seen. Eighty percent of cat bites involved female children, while all dog bites affected males. Playing with the animal was the predominant activity reported in all cases.

Poisoning (7%)

Accidental poisoning resulted either from household medications (50%), or from kerosene (50%). Commonly involved medications were antidepressants, sedatives, cough mixtures and antihistamines. In all cases, the medications had been kept in kitchen cupboards, on dining tables and dressing tables, while in 66% of cases of kerosene poisoning, the fuel had been kept in soft drink bottles in the kitchen.

Foreign Body Injuries (6%)

A variety of foreign bodies were involved, including glass beads, coins, marbles and chewing gum. Objects placed in the nose and ears constituted 7/11 (64%) of injuries from foreign bodies, and occurred in children aged between 4 and 12 years. Choking from solid food occurred in 2 patients in the 0-1 year age group while being fed by an older sibling.

Injury Severity and Outcome

The majority of the injuries were mild in nature (53%), with moderately severe injuries occurring in 39% of cases and severe injuries in 8%. Severe injuries which required hospitalisation or surgical intervention included cases of concussion (1%), lacerated wounds (2%), burns (2%), kerosene poisoning (2%), and musculoskeletal injuries (1%). In 104 patients (61%), treatment was provided at the practice while 23 (14%) patients required referral to hospital. Thirty patients (17%), required no treatment while another 14 (8%) refused any treatment. The 14 patients who refused treatment had wounds that required suturing, animal bites and musculoskeletal injuries for which traditional treatment was preferred. No fatal injuries were recorded on follow-up.

Supervision of the Injured Child

Of the 171 children with injuries, 108 (63%) had a caregiver present at the place of injury. In the 0-1 year age group, 95% had a caregiver present. There was a

significant decline in the percentage of children with caregivers as their ages increased from 0 to 12 years (chi square p = 0.02). Most of the carers (88%) had 1 or 2 children under their care at the time of the injury. The most common activity of the carers at the time of injury was cooking or performing other household chores (43%).

Discussion

The results of this study, conforms in general to the findings of earlier local hospital based studies. However, some differences which are probably due to urban - rural variations in injury pattern and profile of patients seen in general practice were noted. Male children between 6 and 12 years of age formed the largest group of children with injuries. This observation differs from previous local studies where male children below 4 years of age were the predominant group affected[2,3]. The higher number of injuries in the older male children could be related to the more adventurous and risky pastimes they indulge in, compared to younger children. Their participation in the activities of adults, such as gardening, carpentry and performing household repairs, may be contributory. The observation that 50% of the injuries in the 6 to 12 year old age group occurred in the house compound further supports the possibility that the hazardous nature of these activities, plus an unsafe environment, are contributory factors.

Sixty-three percent of the children were supposedly being supervised at the time of injury. Approximately 60% of the families of the children had between 4 and 5 children below 12 years of age staying together. It would be expected that the presence of several young children in the family would result in less adequate supervision and protection to the children. The fact that the majority of the injured children had supervision indicates that factors other than the mere presence of supervision such as the quality of supervision and an inability to provide a safe environment within the household may be contributory.

Leila and Robinson[2] had reported a higher incidence of home injuries in children from poor families and those of Malay ethnic origin. This study did not show a significant difference in injury numbers in children with family incomes of < 500 Malaysian Ringgit or ≥ 500 Malaysian Ringgit (chi square p = 0.27).

The observation that the house compound was the most common location with the kitchen being the next common also differs from previous studies where the kitchen, bedroom and living room were reported as the most common locations[3,10]. The reasons why most injuries occurred in the relatively modern single-storey brick houses while 65% of rural homes are the traditional double-storey wooden structures is unclear. Probable reasons include their architectural design, the smaller nature of the houses with a limited play area - and hence the possibility of increased play being outside - or the more hazardous products and equipment available in these households. The difference could also be due to the preference shown by residents from these relatively modern houses for being treated at general practices.

The injury types as observed in this study are similar to previously published Malaysian studies[2,3]. In the 0-1 year age group in which falls contributed to 42% of all injuries, the contribution of baby walkers (37%) is noteworthy. Earlier studies have highlighted the hazards arising from the use of such equipment[5]. Falls from baby walkers in infants were equal in number to falls from furniture, cradles and staircases collectively. Falls from motorcycles and bicycles in children over 4 years reflects the tendency of rural children to play with these vehicles within the house compound or close vicinity. The pattern of poisoning by kerosene and household medications reflects the easy availability of such items to children in rural households.

The finding that 28% of the children had sustained a previous injury within 6 months of the present injury suggests the existence of the accident prone child for whom greater emphasis may be directed. As minor accidental injuries not requiring admission have been shown to predict subsequent accidental injuries requiring admission, identification of such children with repeated injuries is an important preventive measure[11]. A general lack of knowledge on post-injury care among the respondents which contributed to injury morbidity was evident in this survey. An example is the induction of vomiting after kerosene poisoning.

It can be concluded that the major contributing factors to the injuries were the existence of unsafe home environments, risk taking activities of children and the easy accessibility to hazardous products in the household. Detailed discussion with the respondents on the circumstances of the injuries revealed that unrealistic parental attitudes to injury prevention and poor quality of supervision were other possible contributory factors. Examples of unrealistic accident prevention measures expressed by the respondents include that of advising the child to be careful, punishing the child as a deterrent for misbehaviour, restricting the child's play activities and seeking the assistance of spiritual healers.

A study of this nature confined to rural practice population may have certain limitations. Injuries treated by other health care providers such as hospitals, pharmacies and traditional healers and at home were not accounted for. It remains uncertain to what extent selection bias was operating, or how generalisable the results are to other rural areas of Malaysia, although it is likely that this study more accurately reflects injuries occurring in the community than was known from previous hospital-based studies. Cognitive factors such as parental anxiety, embarrassment, guilt and inability to recall could have led to exaggeration, denial or under-reporting of the injury event. However, a clear message that has emerged from the study is that most domestic injuries are preventable by simple, inexpensive measures. Parental education will play an important role in the prevention of future childhood injuries.

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