

MINOR INJURIES IN NINTH CLASS SCHOOL CHILDREN OF CHANDIGARH AND RURAL HARYANA

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Objective: To estimate the incidence of minor injuries and to study the wound care practices of school children. **Design:** A fortnightly follow up of urban (n=112) and rural (n=110) high school children was done in Chandigarh and rural Haryana between 1990-1992. Initial point prevalence survey was followed by fortnightly follow up survey involving interview for assessing incidence and wound care practices among students. **Setting:** Government high schools of Chandigarh and rural Ambala in between 1990 to 1992. **Subjects:** Ninth class school children from urban (n=112) and rural (n=110) areas. **Results:** Average episodes of minor injuries per year were 2.9 in rural and 2.1 in urban area, point prevalence was higher in urban area. First-aid training of teachers or the students was lacking in both the areas. Many of the injuries (41-46%) occurred during the school time. Fingers/hand or feet were affected most. Main sources of injuries were farm implements, thorn, blade and stick in rural area and finger nails, kitchen appliances and furniture in urban area. Rural students were more tolerant to minor injuries. Lesser number of rural students had taken tetanus toxoid. Wound washing with water as the first action was reported by 20-22% students in both the areas. Application of urine or chewed grass was reported by rural students only, whereas use of ointment, tablet, bandage, injection as the first action was observed in urban students only. **Conclusions:** Incidence of minor injuries was higher in rural area as compared to urban area. Training of students on elementary hygienic wound care is recommended.

Key Words: Injury, Wound, School health.

MINOR injuries are quite common in school children because of the range and extent of their activities which expose them to such episodes(1). Most of the research on childhood injuries in recent past in India and abroad has focussed on major and/or fatal injuries (2,3). Non-fatal, minor injuries have not been adequately studied. Study of wound management practices of school children is also important since many incorrect and 'unhygienic' practices have been reported among them (1). Data on the extent of such injuries in school children and on their wound care practices is not available in India.

Present study was conducted to get such information in Chandigarh and rural Haryana.

Material and Methods

The study was conducted with an aim to interview 100 students (50 boys, 50 girls) each in the urban and the rural area. Only ninth class was studied, since in tenth class students are usually busy preparing for board exams. For this purpose 2 government high schools in urban (Chandigarh) and 3 in rural (Raipur, Rani, Haryana) area were randomly selected. First a list of government high schools of

Chandigarh was procured from district education officer.

A preliminary scrutiny had revealed that 2 schools will yield requisite number of students of both sexes. There were 3 sections each in the ninth class of the 2 schools selected. A list of the students was acquired for all the sections from the attendance registers. A total of 112 students (56 boys, 56 girls) were initially selected to account for anticipated dropout or lost to follow up cases. In both the schools equal number of the students was selected from the 3 section, *i.e.*, around 10 boys and 10 girls from each section were selected by noting down the names of boys and girls appearing first in the attendance register.

The headmistresses and class teachers were explained about the purpose of the study. The study was conducted during vacant periods or games period. A pretested, pilot-tested interview schedule was used for the study. It had details on identification data, occupation of father, follow-up visit notes, knowledge, attitude and practices (KAP) of students regarding minor injuries, details of injury (size, site, cause *etc.*), treatment seeking behavior and details on healing. Cuts, abrasions, pricks, small lacerations and extending beyond 5-6 cm were taken as minor injuries. Schoolwise details on first-aid facilities, availability of medicine kits, training status of teachers and students on first-aid, potential sources of injuries were also noted. On the first day when the social worker visited the school, she noted the names of the students included in the study. All students were contacted and were asked if they had any trivial injury on that day in order to get the data on point prevalence. Students in the first section of one school were also interviewed on KAP regarding trivial injuries. Over the next 2 days, other sections were covered for KAP study.

After completion of the first round, follow-up visits were made for each student at fortnightly intervals. During these visits students were asked if they had any injury since last visit. A quick check up of face, limbs, *etc.* was done for any evidence of trivial injury if the answer was in negative. An injury detail proforma was filled up if an injury was reported.

During the subsequent follow-up visits, details on healing of the reported wound were noted. These visits continued throughout the year except during examination or vacations. Students who dropped out of school were excluded from the study. However, the information collected till the time of their exclusion was included in the analysis.

The same procedure was followed in rural area also where 3 schools (having only one section each in Class IX) were randomly selected from a list of 24 such schools. All the girls (n=55) in Class IX of the 3 schools and an equal number of boys were selected.

The survey was conducted during August 1990 to mid February 1992. The study remained suspended during examinations/summer vacations (March-June 1991) and during October 1990 (student agitation). Thus, our observations are confined to remaining 14 months (28 fortnightly visits). The mean number of visits per student was 25 in urban and 23 in rural area. Among the excluded students, from both the areas, the mean number of visits was 12.

Results

In rural area 12 students (11%) were excluded (school dropouts) out of a list of 110 students. There were 351 episodes of injuries during the 14 months study period. Average number of episodes were 2.9 per student per year, (corrections have

been made by converting 14 months observation to 12 months; excluded students have been counted as half-student observation). Similarly, in urban area 10 students (9%) were excluded. There were 258 episodes of injuries and the average number of episode per student per year was 2.1. Occupation of the father in rural area was agriculture (29%), service (31%) and skilled job (17%). In the urban area in 59% cases, fathers were in service class families, 25% had skilled jobs and 16% had petty business. Details on type and nature of injuries are given in *Table I*. Many of the injuries (41-46%) occurred during school time. Limbs (arms, hands, feet, legs) were most frequently involved. In the rural area, the main sources of injuries were farm implements (spade, sickle, and plough), razor blade, thorn/stick or stumbling/fall. In the urban area stumbling/fall, finger nails or kitchen appliance (knife, grate, sharp edge of utensils) were the main sources of injury. Sources included in the 'others' column were bricks/stones, pin/needle, wood splinter, pliers and screw drivers. More students in urban area reported pain due to injury (93%) as compared to rural area (78%). Duration of pain was also more in urban area. Wound healing took less than 7 days in 68% rural students as compared to 41% in urban students.

In rural area, 15 students reported injuries on day 1 of the study while in urban area 45 students did so, thus giving a point prevalence of 13.6% and 40.2%, respectively for the two areas. More of the urban students did not report any injury during the entire study period as compared to rural area. (24% in urban area and 18% in rural area; $p < 0.05$). Similarly, significantly more of the girls did not report any injury as compared to boys ($p < 0.005$), for the both areas combined.

Treatment details of injury cases is

TABLE I—Injury Details in Rural and Urban Students

Injury details	Rural students n=358 episodes (110 students)	Urban students n=251 episodes (112 students)
Time		
School time (8 am - 2 pm)	166 (46)	104 (41)
Afternoon (2 pm - 6 pm)	149 (42)	125 (50)
Morning/evening (6 pm - 8 am)	43 (12)	22 (9)
Site		
Fingers	161 (45)	86 (34)
Hand/arms	53 (15)	60 (24)
Leg/foot	109 (31)	62 (25)
Toes	21 (6)	18 (7)
Head /face	14 (4)	25 (10)
Source		
Farm implements	54 (15)	7 (3)
Stumbling/fall	59 (17)	37 (15)
Blades	41 (12)	14 (6)
Fingernails	6 (2)	27 (11)
Thorn/sticks	43 (12)	0
Stone/bricks	26 (7)	14 (6)
Kitchen appliances	25 (7)	31 (12)
Vehicles	12 (3)	6 (2.4)
Playing implements	5 (1.4)	18 (7)
Furniture	4 (1)	18 (7)
Nails	10 (2.8)	21 (8)
Glass bangles	0	12 (4.8)
Wood splinters	12 (3)	10 (4)
Others	61 (17.6)	36 (14.6)
Place		
Field	94 (26)	4 (2)
Playground	74 (21)	90 (36)
Home	58 (16)	98 (39)
Roadside	17 (4.8)	35 (14)
Others	115 (32)	24 (9)

Contd.

TABLE I (contd.)

Injury details	Rural students n=358 episodes (110 students)	Urban students n=251 episodes (112 students)
Duration of pain*		
None	79 (22)	18 (7)
One day	179 (50)	53 (21)
2-4 days	77 (22)	96 (38)
> 5 days	23 (6)	84 (34)
Routine disturbed* (absenteeism)		
1 day	10 (3)	6 (2)
2-4 days	8 (2)	18 (7)
> 5 days	1 (0.3)	14 (6)
Healing time*		
< 7 days	245 (68)	103 (41)
1-2 weeks	84 (24)	83 (33)
2-3 weeks	19 (5)	39 (16)
> 3 weeks	10 (3)	26 (10)

Figure in parentheses are percentages.

*Differences between rural and urban area highly significant ($p < 0.001$).

shown in *Table II*. In rural areas in 41% cases (145 episodes) no treatment was taken while this was so in 29% (73 episodes) of urban students. Significantly more students (63%) in rural area initiated wound care immediately after the injury as compared to urban area (34%). Only 36% urban student had not taken tetanus toxoid as compared to 91% in rural area. Urinating on the wound or application of chewed grass (28%) was seen only among rural students while application of cotton bandage and intake of tablet/injection was seen in urban students only.

In both rural as well as urban area no medical or paramedical personnel was specifically employed in the school. There was no separate sick room. No first-aid course had been organized for students or teachers in the last 5 years. In urban areas, there was a separate medicine cupboard

TABLE II-Treatment Details

Treatment	Rural students (n=213)	Urban students (n=178)
Agencies consulted*		
None	145 (41)	73 (29)
1	175 (49)	131 (52)
2 or more	38 (11)	47 (19)
Treatment lag (h)*		
Immediate	134 (63)	61 (34)
0-1	32 (15)	73 (41)
2-6	25 (12)	22 (12)
>7	22 (10)	22 (12)
Tetanus toxoid*		
Not taken	327 (91)	90 (36)
Taken earlier	18 (5)	153 (61)
Taken now	13 (4)	8 (3)
Money spent (Rs)*		
<20	52 (24)	16 (9)
21-100	2 (1)	16 (9)
First action taken		
Washed with water	46 (22)	35 (20)
Mercurochrome/ GV paint/dettol	42 (20)	30 (17)
Turmeric/mustard oil	51 (24)	14 (8)
Urine/chewed grass	60 (28)	0
Kerosene	6 (3)	9 (5)
Local pressure	6 (3)	13 (7)
Cotton/bandage	0	20 (11)
Tablet/injection	0	7 (4)
Ointment		19(10.7)
Other	2 (1)	31 (17)

Figures in parenthesis are percentages.

*Differences between rural and urban area highly significant ($p < 0.001$)

that was looked after by a teacher. The cupboard had bandage, cotton, blade, spirit, savlon, soap, analgesics, mercuriochrome solution, antiemetics, skin ointment, blanket, bedsheets, weighing machine and glucose powder.

The school building in the urban area was multistoreyed and had stairs with side rails. The distance from main road and from the nearest Government dispensary was 500 metres. In rural area the school building was single storeyed. The nearest dispensary was within one kilometre. The school has some elementary medicines (antipyretics, analgesics, tincture iodine, eye ointment) under the charge of a school teacher.

Discussion

In our study the incidence of minor injuries was significantly more in rural students than in urban ones. This indicates that rural life conditions expose the school-children more to injuries. This is also evident by the fact that in rural students more injuries occurred in fields by farm implements like sickles, spade, plough as compared to urban students where more injuries were reported at home. This also indicates that urban school children spend more time at home as compared to their rural counterparts. Hu *et al* (4) had also reported that, in Canada, most injuries in children were sustained at home.

The sources of injuries, consultation rate for minor injuries, school absenteeism and disruption of life-style was different among urban and rural children

In rural area, early wound healing (within 7 days) was reported by significantly more (<0.001) students as compared to urban area. However, the money spent on wound treatment was more in urban students. These results indicate that minor injuries are more or less ignored in rural areas. Significantly, lesser number of rural students had taken tetanus toxoid,

indicating poor outreach of health services and lack of health awareness in these areas.

Washing the wound with water as the first action was reported in 20-22% students in both the areas. Use of turmeric (24%) was more frequent in rural students as compared to urban (8%). An earlier study, from this centre had also reported use of chewed grass or urine for local wound application in rural area (5). Despite use of urine or chewed grass as local application the average wound healing time in rural students was similar to or even lesser (5.1 days) than urban students.

A variety of topical applications have been tried for wound care including honey (6), plant bark extract (7), mud, leaves, alum and vinegar(8). Many of such preparations are harmful and some have doubtful value. A number of herbal remedies have been used by traditional healers in India. Wound healing properties of many herbs have also been described (9). Urine therapy has also been used in various countries, but no real evidence of its therapeutic value has been reported (10). Detailed follow-up studies are needed to analyze the role of these local applications on wound healing. The reasons for a shorter wound healing time in rural students also need further studies.

Fingers were the most prone to injuries (34-45%) followed by the legs, feet, head and arms probably because of more exposure and involvement in physical action. Similar findings were reported in our earlier study (5).

Most (41-46%) injuries occurred during school hours emphasizing the need of training of teachers as well as students in first-aid, regular training should be organized with the help of Red-Cross organizations present in every District. Training on first-aid and correct management of

injuries should also be given due attention in routine curricula of students.

The need of taking a full course of tetanus toxoid should be emphasized in schools, particularly in rural areas. Special importance needs to be given to early wound care since in both rural as well as urban area 10-12% students did not take any action within 6 hours of injury thereby increasing the chances of wound contamination.

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