Childhood Injury: Rate Estimates and Prevention Strategies

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Injury is the leading cause of death and preventable disabilities among children and adolescents in Israel, the United States and other developed countries [1,2]. Based on visits to Emergency Medicine departments for trauma, the estimated annual rate of injuries in children aged 0–17 in Israel was 712 per 10,000 in 1994 [3]. In 2001, there were 187,531 visits of Israeli children to emergency rooms for trauma [4]. With a population of about 2,060,000 in this age bracket [5], the estimated annual rate of injury was 910 per 10,000 (9.1%). These rates are lower than those reported for childhood injuries from large-scale population-based studies. Rate estimates of childhood injury depend on the operational definition, which is usually attendance at a medical facility following an injury. In the U.S. the annual rate of medically attended or temporally disabling injuries was reported a few years ago to be approximately 25 per 100 children [6]. Among the few studies that have attempted to estimate injury rates in children prospectively, the annual incidence rates were about 15–25 per 100 [7]. The lower estimate of childhood injury rate in Israel, as compared to other countries, is in contrast with the findings of a multinational study in schoolchildren, assessed by self-report. In that study, the rate of injury among Israeli youth in the community was high as compared to other countries [8].

A major reason for the lower estimates of childhood injuries in Israel is the reliance on traditional data from emergency room visits. This methodology does not take into consideration the growing share of community-based walk-in clinics and Urgent Care Centers in treating minor injuries, particularly in children. Over the past 17 years tens of such clinics have emerged in Israel. The first major UCC, named TEREM, was founded by the late Dr. David Applebaum. Dr. Applebaum was killed in a suicide bombing on 9 September 2003 together with his daughter Nava and another five people. "An Obituary to David Applebaum," published in the *British Medical Journal*, highlighted his unique personal and professional virtues [9]. Dr. Applebaum, himself a specialist in Emergency Medicine, applied the vast emergency medicine experience that he garnered while in the U.S. to founding this center. The primary reason for the creation of UCCs has been perceived limitations in the provision of care in other settings, such as community clinics (with limited hours of service) and hospital emergency rooms (with long travel and waiting time and high costs). The original goal of UCCs was to reduce the number of inappropriate visits to ERs by providing less costly services with prompt response. These characteristics made the UCCs very useful for treating children and adults with minor trauma. TEREM became a model for several UCCs that emerged during the same period and for many more established subsequently. It was estimated that by 1994 there were close to 600,000 visits to UCC facilities in Israel, representing about a third of the visits to emergency services during the same period [10]. This proportion remained similar in 2004, at least in Jerusalem. Whereas TEREM and a few smaller UCCs in Jerusalem had treated a little more than 100,000 patients annually, the departments of Emergency Medicine of the four general hospitals in the western part of Jerusalem together had treated about 200,000 patients. In 2004, the central branch of TEREM alone had treated 88,293 patients, of which 39.8% were children and adolescents (i.e., 0–17 years old). Approximately 93% of all visitors to TEREM were discharged home. Thirty-one percent of the patients were treated for accidents. (Nahum Kovalski MD, Deputy Director, TEREM, personal communication).

A report on childhood accidents in this issue of *IMAJ,* of which Dr. Applebaum was a co-author, discloses some interesting aspects of this problem and at the same time provides an insight into the real estimate of childhood injury in Israel [11]. In this report the relationship of socioeconomic variables to incidence, supervision and rapidity of seeking medical care following injury was studied among 333 children in Jerusalem. Of these, 131 (39%) went to TEREM and the rest to the Shaare Zedek Medical Center. Since the data from the study were not population-based and derived from a convenience sample, the incidence of childhood accidents could not be assessed. Nevertheless, the proportion of patients treated for trauma in the UCCs in Israel in 1996 (28%) [10] was similar to that of TEREM patients treated for trauma in 2004 (31%). These figures are close to the proportion of children treated for trauma in Israeli ERs in the general hospitals, about a third [12]. Therefore, it seems likely that the national estimate for childhood injury should include the large number of children treated in UCCs across the country. This means that the rate of childhood injury in Israel is probably about 50% more than previous estimates [3,13], or closer to 15 per 100 children per year.

Since injury in children and adolescents has major public health implications, the magnitude of this problem should be thoroughly explored. Even more important is to study the risk factors, identify populations at risk, and expand the preventive education program for this population. The current approach towards injury prevention in Israel, guided by the National Cen-

UCC = urgent care center
ER = emergency room

ter for Child Safety and Health, B'TEREM, uses a multi-faceted "five E's" plan, which includes: Evaluation and research, Education, Enforcement and Enactment, Environmental and product changes, and community Empowerment.

Education is provided by means of anticipatory guidance for injury prevention. This should be at both the individual level (giving injury prevention tips to parents of infants and young children) and by increasing public awareness through lectures, the media and community-based activities. Tips on how to prevent injury are given to parents on a regular basis during their visits with the baby to the local Mother and Child Health Clinic (*Tipat Halav*), a network of clinics across the country. These tips are given by nurses who were trained for this program, using a special kit developed jointly by B'TEREM and the Ministry of Health. In view of this, the finding in the present study that only 22% of parents reported having received accident prevention instructions from a physician or a nurse since becoming parents is disappointing. However, it should be noted that this study was conducted between 2000 and 2003, and the mean age of the injured children was 4.8 years, whereas the injury prevention education program is given mostly during visits with infants, and less frequently after the first year of life. This means that the visits by parents of the study population to the MCHC with their children (either the subjects of this study or their younger siblings) occurred a few years before the study period. Although the injury prevention program has been given on a regular basis in MCHCs in Jerusalem since September 2000, it is likely that some families were not exposed to this program. Also, since the present report [11] is a retrospective study based on recall of parents of injured children during their visit for acute trauma, it is not representative of the general population. Nevertheless, the results of this study mandate increasing the activity of the injury prevention program, and expanding it also to parents of children beyond the first year of life. A prospective study of the coverage of this program and its yield in an unbiased cohort is needed.

Finally, the causes of injury in this study were different from those found in a large-scale study of injured children conducted at the Schneider Children's Medical Center of Israel during 1996 [12]. The main differences were: four times higher proportion of burns among children in the present study (14.1% and 3.1%, in Jerusalem and Schneider, respectively) and four times higher proportion of poisonings (11.4% and 2.8%, respectively). By contrast, the proportion of motor vehicle accidents among children in Schneider (7.8%) was twice that of children in Jerusalem (3.9%). These differences call for emphasizing the specific threats that are relevant to the different communities. In public health services it is always recommended to "think globally, act locally."

The high frequency of burns among children in Jerusalem deserves special consideration due to the severe consequences. Although the circumstances of the burns were not specified, burns that occur in children at home in a predominantly (88%) Orthodox Jewish population, as in this study, are often caused by large coffee urns of water that are maintained at a steady almost boiling temperature over the Sabbath (Friday night and Saturday). This hazard could be drastically reduced by increasing public awareness, and by employing simple practical tips, such as moving the coffee urn out of reach of young children, and shortening the electric cord to prevent the child from accidentally pulling the cord and toppling the urn. Also, a technical solution is presently being developed to secure the lid of the container with clips in the event that the urn falls over.

In conclusion, the study of Schwartz et al. [11] highlights the issue of childhood injury as a major, yet preventable, public health problem. Analyzing the number and circumstances of such injuries is helpful in improving the prevention strategy, mainly by addressing the specific threats relevant to the different communities.

MCHC = Mother and Child Health Clinic

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