

Incidence and Causes of Injury Deaths among Children under Five Years of Age in El-Giza -Egypt

Ahmed Mohmed Gad Allah

Faculty of Medicine || Al-Azhar University || Assuit || Egypt

Abstract: Objectives: To study the incidence and causes of injury mortality among children under the age of five years in El-Giza.

Setting: The study was conducted in El-Giza, Egypt, the second largest city with a population of ~ 8.7 million for 2017. It comprises urban and semiurban settlements.

Methods: A descriptive epidemiological study, which obtained information about all deaths using a questionnaire from 197 Health Centres for one year, 2017. Subjects were residents who died from unintentional and intentional injuries.

Results: The overall under fives crude mortality rate was 3.1 per1000. The number of children deaths from injuries was 309(8.7% of all deaths), more among males than females (31.5 v 23.1 per 100 000). Those under 1 had the highest rate, 32.7 per 100 000. The top three causes of deaths were traffic accidents (31.7%), falls (18.8%), and drowning (11%).

Conclusions: Injury is the common cause of deaths among children under five years of age in El-Giza. Because all age groups and both sexes are victims of injuries, and most unintentional injuries are preventable, they must be considered as a priority health problem in El-Giza. More studies are needed in rural areas of Egypt.

Recommendations: It is important that child health community in Egypt and in other developing countries enhances its focus on injury as a child health issue and integrate injury prevention efforts in child health policies and programmers.

Keywords: Injury deaths, children, El-Giza, Egypt.

مدى انتشار وأسباب الإصابات المميتة بين الأطفال الذين تقل أعمارهم عن 5 سنوات في الجيزة – مصر

أحمد محمد جاد الله

كلية الطب || جامعة الأزهر بأسسوط || مصر

الملخص: ما زالت الإصابات المميتة- حتى يومنا هذا- تمثل مشكلة اجتماعية وصحية كبيرة خاصةً بعد الإنجازات الواقعية في الوقاية والعلاج من الأمراض المعدية. على النطاق العالمي يموت أكثر من 875000 طفل سنوياً نتيجة الإصابات معظمها في البلاد الفقيرة ومتوسطة الدخل. إن معدل انتشار الإصابات في الأطفال يقترن بعوامل مثل السن والنوع والسلوك والبيئة لذا فإن الأطفال الذين يعيشون في بيئات اجتماعية واقتصادية متدنية أكثر عرضةً للإصابات القاتلة وغير القاتلة. في المجمل يموت طفل نتيجة الإصابة غير المتعمدة من بين خمسة وفيات في الأطفال نتيجة أسباب أخرى ومن لطف القدر أن معظم هذه الإصابات المميتة يمكن الوقاية منها لذا ركزت في هذا البحث على هذه المرحلة العمرية في واحدة من أكبر محافظات مصر وهي الجيزة وكان الهدف من البحث دراسة معدل انتشار وأسباب الإصابات المميتة في الأطفال الذين تقل أعمارهم عن 5 سنوات للحد من انتشارها والوقاية منها. وعلى مدار عام من الدراسة تم حصر حالات الإصابات المميتة في الأطفال في تلك المرحلة العمرية من 197 مركز صحي على مستوى المحافظة. وقد أسفرت النتائج عن حصر 309 حالة بنسبة 8.7% من كل الوفيات وكانت نسبة الإصابة في الذكور 59.9% والإناث 40.1% وكان الأطفال الأقل

من عام الأكثر تعرضاً لخطر الإصابات المميتة وقد أظهرت النتائج عن ثلاثة أسباب رئيسية للوفاة وهي حوادث السير والمرور (31.7%) والسقوط من علو (18.8%) والغرق (11%). الاستنتاج والتوصيات: الإصابات التي تؤدي إلى الوفاة شائعة الحدوث بين هؤلاء الأطفال الذين تقل أعمارهم عن 5 سنوات في محافظة الجيزة. ولإن كل المراحل العمرية (سواء كانوا ذكوراً أو إناثاً) ضحايا تلك الإصابات وأن معظم الإصابات المميتة غير المتعمدة من الممكن الوقاية منها لذا يتحتم علينا أن تكون من أولويات المشكلات الصحية في بلادنا وأن نقيم الندوات القومية والمؤتمرات الدولية وأن يتيسر للباحثين المعلومات الوافية لعمل دراسات أخرى في المناطق الريفية والفقيرة.

الكلمات المفتاحية: الإصابات المميتة، بين الأطفال، الجيزة.

INTRODUCTION

Today, injuries remain a major social and health issue, particularly because substantial achievements have been made in the prevention and treatment of infectious diseases⁽¹⁾. Accidental injuries constitute the leading cause of death in children and young adults. Worldwide, over 875 000 children aged ≤ 18 years die annually as result of injuries, mostly in low-and middle-income countries (LMICs), and injuries account for 13% of the total morbidity among children aged ≤ 15 years⁽²⁾. The incidence of childhood injuries is associated with factors such as age, sex, behaviour and environment^(3,4). Restricted mobility, limited environmental exposure, anatomical and physiological differences make the nature, causes and preventive strategies different among this group compared to older children. Countries such as Iran and Bangladesh have found a significant burden of injuries in this age group^(5,6). Children of lower socioeconomic status generally have a greater risk of both fatal and non-fatal injuries⁽⁷⁾. In total, about 1 in 5 child deaths is a result of an unintentional injury. Fortunately, these deaths and injuries are largely preventable⁽⁸⁾. Data on the epidemiology of unintentional injury in low-income countries are still scarce⁽⁹⁾. Due to a lack of organisation and funding, the data capture systems in Egypt are inadequate. Data on deaths are mainly collected in Health Centres. They are staffed by one or two trained native health workers. Their main function is to offer primary health care services. Some of their responsibilities are educating the public about health matters, providing simple treatments and family planning services, monitoring children for growth and development, environmental health activities, and recording health information. However, their activities exclude injury control and prevention and their data exclude details about deaths from unintentional injuries. However, no previous study in Egypt has attempted a comprehensive regional analysis of accidental deaths. This is the first study to provide injury mortality rates of children under five years of age in El-Giza, Egypt. In this study, an epidemiological description of deaths from unintentional injuries is present.

METHODS

In mid-2011, the national population was estimated at 81 million, meaning Egypt has one of the highest population densities in the world. According to the 2006 census, 42.9% of the total populations were urban residents, 51.1% were male and 10.6% were under 5 years of age⁽¹⁰⁾.

This cross sectional study collected information from 197 Health Centres in El-Giza. For inclusion, the injury had to be unintentional and intentional and led to death between January and December 2017. A checklist questionnaire was sent to 197 Health Centres asking about cause of the death, age, sex, place of residence of victims, and also a brief description of the accident. An instructional sheet was attached to the questionnaires, which the health workers were asked to read carefully. Since the health workers were chosen from the main area, in which the Health Centre is stationed. They record all deaths that occur in their area.

The definitions of external causes of injury and poisoning used in this study followed the International Classification of Diseases, 10th Revision (ICD-10)⁽⁸⁾.

STATISTICAL ANALYSIS

Analysis was done using SPSS V.16. The injury mortality rate for children was calculated per 100 000 population. Simple frequencies and percentages were reported for variables, for example, type of injuries, age groups and sex.

RESULTS

Table 1 shows total population, number of all deaths, and number of deaths from injuries by age group and sex. Males aged 1—4 had the highest proportion of deaths from injuries, 28.5% of all deaths. Table 2 shows number and percentage of deaths from different types of injuries by sex. The top three causes of deaths resulted from injuries were traffic accidents (31.7%), falls (18.8%), and drowning (11%). For all type of injury deaths, 59.9% occurred in males and 40.1% in females. Compared with other causes of injury deaths, traffic accidents were the most important cause of injury deaths (31.7%). The injury deaths from traffic accidents were nearly same among males, 31.9%, and females, 31.5%. There was a higher percentage of injury deaths from drowning (13% v 8.1%) in males compared with females. However, there was a higher percentage of injury deaths from falls (19.4% v 18.4%), homicide and legal intervention (10.5% v 9.2%), and burns (7.3% v 5.4%) in females compared with males. Table 3 shows number of deaths from different type of injuries by age group and sex. Most deaths from injuries were from traffic accidents with 59 for males and 39 for females. Table 4 shows mortality rate per 100 000 for injuries by age group and sex. Mortality rate for injuries for all age groups was 27.5 per 100 000. Males of all age groups had a higher mortality rate for injuries than females. Of all deaths from unintentional injuries 34% occurred in summer, 27% in spring, 21% in autumn, and 18% in winter.

Table (1) Total population, number of all deaths, and number of deaths from injuries by age& sex

	0 – 1		1 – 4		Total
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>	
Total population	125 756	115 977	462 325	421 586	1 125 644

	0 – 1		1 – 4		
No of all deaths(death rate/1000)	1509 (12)	1177 (10.1)	481 (1)	378 (0.9)	3545(3.1)
No of deaths from injuries	48	31	137	93	309
Percentage of injury deaths to all deaths	3.2	2.6	28.5	24.6	8.7

Table (2) Number and percentage of deaths from different type of injuries by sex

	Males	Females	Total
Traffic accidents n(%)	59(31.9)	39(31.5)	98(31.7)
Falls n(%)	34(18.4)	24(19.4)	58(18.8)
Drowning n(%)	24(13)	10(8.1)	34(11)
Homicide& legal intervention n(%)	17(9.2)	13(10.5)	30(9.7)
Burns n(%)	10(5.4)	9(7.3)	19(6.1)
Ingestion suffocation n(%)	7(3.8)	4(3.2)	11(3.6)
Inhalation suffocation n(%)	2(1.1)	2(1.6)	4(1.3)
Electrical accidents	3(1.6)	1(0.8)	4(1.3)
Poisoning	1(0.5)	1(0.8)	2(0.6)
Others n(%)	28(15.1)	21(16.9)	49(15.9)
Total n(%)	185(59.9)	124(40.1)	309(100)

Table (3) Number of deaths from different type of injuries by age group and sex

	0 – 1		1 – 4		Total	
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
Traffic accidents	11	6	48	33	59	39
Falls	9	5	25	19	34	24
Drowning	4	2	20	8	24	10
Homicide & legal intervention	2	3	15	10	17	13
Burns	1	1	9	8	10	9
Ingestion suffocation	5	3	2	1	7	4
Inhalation suffocation	1	2	1	_____	2	2
Electrical accidents	_____	_____	3	1	3	1
Poisoning	_____	_____	1	1	1	1
Others	15	9	13	12	28	21
Total	48	31	137	93	185	124

DISCUSSION

This study showed that many children in El-Giza die from injuries. Males had a higher rate than females, and traffic accidents, falls, and drowning were the most important causes of deaths. To the best of my knowledge, study of injury deaths among children was not reported yet at my country. This study was the first on injury deaths in El-Giza carried out for a large population. Because of health workers cooperation we obtained a 100% response rate. This study showed age and sex differences that have been shown in some other studies^(11,12,13).

To my knowledge, there is no directly comparable Egyptian study. There is significant regional variation. In Bangladesh, 30% of deaths between 1 and 5 years of age are caused by injury, compared to 9% in India and 11% in Pakistan^(9,14,15). Similarly, the unintentional injury rate in Bangladesh is 96 per 100 000 children, two and half times that of Pakistan⁽¹⁴⁾. Bangladesh's high mortality rates are primarily due to drowning which is the cause of injury-related mortality in 90% of cases⁽¹⁶⁾. The results of this study reinforced the importance of unintentional injuries as a major cause of deaths. Berger and Mohan explained that the major types of injuries in developing countries are traffic accidents, falls, drowning, and poisoning⁽¹⁷⁾. However, the nature and extend of injuries vary according to urban or rural areas.

In this study, the main causes of accidental deaths were very similar to Berger and Mohan's findings. Table 5 gives a comparison of injury mortality rates of different parts of the world^(14,18). Forjuoh states that "developing countries are now hanging between the stages of epidemiologic polarization and protracted epidemiologic transition"⁽¹⁹⁾. Many developing countries achieved good results in reducing morbidity and mortality from infectious diseases by dedicated effort. However, the importance of unintentional injuries as one of the major causes of death is undeniable, and the science of injury control should be a national task. In many developing countries, developments in motorization and industrialization occurred much faster than in industrialized countries, without the accompanying other improvements, and it may increase the number of accidental deaths⁽²⁰⁾. About 50 years ago, the European Office of the World Health Organization suggested that countries should have a central institution, governmental or non-governmental, designated for child safety⁽²¹⁾. There are many known effective strategies that may be implemented to protect children^(22,23,24). Moreover, differences in deaths and injuries among demographic subgroups and causes of unintentional injury not only demonstrate that more is possible, but also signal where to focus our efforts for greater efficiency. Clinicians are trusted advisers with a significant role to play in child injury prevention^(25,26,27). Clinicians provide anticipatory guidance regarding a host of issues, so that parents are aware of risks and prevention strategies⁽²⁸⁾. There is no injury organization, funding, or data capture system in Egypt at present.

Table (4) Injury mortality rates of children between 1 and 4 years of age—rates from the other parts of the world

Countries	Injury mortality rate (1 – 4 years per 100 000 population per year)*
Pakistan*	37
Iran	33.4
Bangladesh	92
Thailand	30.4
Philippines	74.7
Vietnam	52.8
Eastern Mediterranean Region	
All	49.4
HICs	30.2
LMICs	50.5
World	
All	45.87
HICs	8.5
LMICs	49.7

*Includes unintentional and intentional injuries while rest of the data from other regions are only unintentional injuries. HICs, high-income countries; LMICs, lower middle-income countries.

LIMITATIONS

There were some limitations in this study. Lack of detailed information made it impossible to present complete data about place and time of deaths or more details about the victims.

RECOMMENDATIONS

Injury related policies must be considered as a priority health problem in this country, and a well-organized system established for childhood accident prevention. International support as well as national efforts may enhance the chances of prevention and control of these injuries in Egypt.

REFERENCES

- 1- Wang, H., Liu, X. Liu, Y. and Lin, Y. Shen. "Incidence and risk factors of non-fatal injuries in Chinese children aged 0 – 6 years: A case-control study". *Injury Int J. Care Injured*, 42:521-524: (2011).

- 2- Hyder, A.A., David, E. Sugerman, D.E., Razzak, J. and El-Sayed, H. " Global childhood unintentional injury surveillance in four cities in developing countries: a pilot study. Bull World Health Organ, 87:345-352: (2009).
- 3- Danseco, E.R., Miller, T.R. and Spicer, R.S. " Incidence and costs of 1987 – 1994 childhood injuries: demographic breakdowns". Pediatrics, 105(2):E27.
- 4- Yousef, Z.S., Hemmati, H., Ali, Z.A., Karimi, A., Ahmadi, M. and Mohammadi, H. " Pediatric Unintentional Injuries in North of Iran". Iran J Pediatr, 18(3):267-271: (2008).
- 5- Naghavi, M., Poumalek, F. and Shahraz, S. "The burden of injuries in Iranian children in 2005". Popul Health Metr, 8:5: (2010).
- 6- Rahman, F., Rahman, A. and Linnan, M. " The magnitude of child injuries in Bangladesh: a major child health problem". Inj Control Saf Promot, 11:153-7: (2004).
- 7- Jablonska, B., Lindblad, F. Ostberg, V., Lindberg, L., Rasmussen, F. and Hjem, A. "A national cohort study of parental socioeconomic status and non-fatal suicidal behaviour – the mediating role of school performance". BMC Public Health, 12:17 (2012).
- 8- Ann, D. and Julie, G. "Leading causes of fatal and non-fatal unintentional injury for children and teens and the role of lifestyle clinicians". Am J Lifestyle Med, 13(1):7-21 (2019).
- 9- Razzak, J.A., Khan, U.R., Zia, N. and Azam, I. " A child an hour: burden of injury deaths among children under 5 in Pakistan". Arch Dis Child, 98:867-871. (2013).
- 10- Population Division of the Department of Economic and Social Affairs of the United Nations Secretariate, World Population Prospects: The 2010 Revision <http://esa.un.org/unpd/wpp/>(accessed on 5 November 2012).
- 11- Manciaux, M. and Romer, C. "Accidents in childhood and adolescence. The role of research". Geneva: World Health Organisation, 1991.
- 12- Joly, M., Foggin, P., Pless, I. "Geographical and socioecological variations of traffic accidents among children". Soc Sci Med, 33:765-9 (1991).
- 13- Avery, J. and Jackson, R. "Children and their accidents". London: Edward Arnold, (1993).
- 14- Aminur Rahman. Directorate General of Health Services, Ministry of Health and Family Welfare, Government of the People's Republic of Bangladesh, 2005:200.
- 15- Jagnoor, J., Bassani, D.G. and Keay, L. " Unintentional injury deaths among children younger than 5 years of age in India: a nationally representative study". Inj Prev, 17:151-5 (2011).
- 16- Chowdhury, S.M., Rahman, A. Mashreky, S.R. and Giashuddin, S.M. " The Horizon of Unintentional Injury among Children in Low-Income Setting: An Overview from Bangladesh Health and Injury Survey". J Environ Public Health 2009.
- 17- Berger, L. and Mohan, D. "Injury control-a global view". Delhi: Oxford University Press, 1996.

- 18- Peden, M. , Oyegbite, K. and Ozanne-Smith, J. " WHO World Report on Child Injury Prevention". Geneva: World Health Organization, UNICEF, 2008.
- 19- Forjuoh, S.N. " Injury control in developing nations: what can we learn from industrialized countries". *Inj Prev*, 2:90-1 (1996).
- 20- Soori, H. and Naghavi, M. "Childhood deaths from unintentional injuries in rural areas of Iran". *Inj Prev*, 4:222-4 (1998).
- 21- European Public Health Committee. "Accidents in childhood as a public health problem". Strasbourg: Council of Europe, 1972.
- 22- Community Guide. "Motor vehicle injury". <https://www.thecommunityguide.org/topic/motor-vehicle-injury>. Accessed February 16,2017.
- 23- Gilchrist, J. and Ballesteros, M.F. " Vital signs: unintentional injury deaths among persons aged 0 – 19 years — United States 2000 – 2009. *MMWR Morb Mortal Wkly Rep*, 61:270-276 (2012).
- 24- Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). Atlanta. GA: US Department of Health and Human Services, <https://www.cdc.gov/injury/wisqars/index>. Accessed February 16, 2017.
- 25- Gardner, H.G. "American Academy of Pediatrics Committee on Injury, Violence and Poison Prevention. Office-Based Counseling for unintentional injury prevention. *Pediatrics*, 119:202-206 (2007).
- 26- Quinlan, K.P., Sacks, J.J. and Kresnow, M.J. " Exposure to and compliance with pediatric injury prevention counseling — United States, 1994. *Pediatrics*, 102:e55 (1998).
- 27- Chen, J., Kresnow, M.J., Simon, T.R. and Dellinger, A.M. " Injury prevention counseling and behavior among US children: results from the second Injury Control and Risk Survey. *Pediatrics*, 119:e958-e965 (2008).
- 28- Green, M. Bright Futures. "Guidelines for Health Supervision of Infants, Children and Adolescents. McLean, V.A.: National Maternal and Child Health Clearinghouse: 1994.