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Nasilne smrti i maksilofacijalne ozljede u djece i adolescenata iz Campine Grande, PB, Brazil

Violent Deaths and Maxillofacial Injuries in Children and Adolescents in Campina Grande, PB, Brazil

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Sažetak

Cilj: u ovom istraživanju je procijenjen mortalitet od vanjskih uzroka kod djece i adolescenata, te pojavnost maksilofacijalnih ozljeda u gradu Campini Grande, PB, Brazil, u 2003. godini. **Metode:** Pregledano je 837 forenzičnih medicinskih izvještaja, a od njih odabrano 115 žrtava (13.7%) od 0 do 18 godina. Uzroci su klasificirani u skladu s Poglavljem XX Međunarodne klasifikacije bolesti – CID 10. Podaci su obrađeni Epi-Info 3.4.1. programskim paketom. Asocijacija ispitivanih varijabli: tip uzroka i maksilofacijalne ozljede kao zavisne i spol i godine kao nezavisne varijable korištenjem Hi-kvadrat i Fisherova testa ($p < 0.05$). **Rezultati:** Opažen je viši mortalitet kod dječaka (70.4%) te kod starosne grupe od 14 do 18 godina (50.3%), premda bez statistički značajne razlike među starosnim skupinama i spolu ($p = 0.149$). Prevladavale su prometne nesreće (32.2%), i dodatno kao pješak (37.8%). Ustanovljeno je da muški imaju 4.6 puta veću mogućnost da budu žrtva vatrenog oružja, nego ženska djeca. Žrtve su zadobile višestruke ozljede, uz prevladavanje abrazija (39.4%) i rana (24.5%). Prevalencija ozljeda glave je bila 22.5%, a lica 20.4%. Maksilofacijalne ozljede su identificirane kod 41.7% žrtava. Šest žrtava (12.5%) je imalo frakture, većinom mandibule (37.5%). Žrtve prometnih nesreća imale su 2.9 puta veću vjerojatnost za dobitvanje ozljeda maksilofacijalnog područja. **Zaključak:** Dječaci od 14 do 18 godina su većinom bili žrtve vanjskih uzroka, većinom prometnih nesreća, i pojavnost višestrukih ozljeda glave i lica je bila učestala.

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Ključne riječi

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Uvod

Smrt zbog vanjskih čimbenika može se definirati kao neprirodna smrt uzrokovana hotimičnim djelovanjem ili izrazito okrutnog uzroka (1). Iz toga proizlazi da je to događaj karakteriziran nekom vrstom nasilja u svojoj pojavnosti i uključuje slučajne događaje kao što su prometne nesreće, padovi, otrovanja i utapljanja, kao i hotimične oblike poput fizičkog napada i samostalno nanesene ozljede (2).

Vanjski uzroci povezani su s velikim brojem smrti u gotovo svim državama, uvijek kao drugi ili treći uzrok smrti (3), i glavni su uzrok mortaliteta i trajnog invaliditeta u djece i adolescenata u zemljama u razvoju (4-6). U Brazilu, unatoč napredovanju medicine i javnog zdravstva, posljednjih godina mnoga djeca i adolescenti umiru od uzroka koji su se mogli izbjeći i predstavljaju ozbiljan javnozdravstveni problem (7).

U istraživanju provedenom 1971. i 1991. u 15 američkih država, Brazil je jedna od država gdje se pokazala tendencija

Introduction

Death due to external factors may be defined as an unnatural death caused by voluntary interference or by an extremely brutal cause (1). It is therefore an event characterized by some kind of violence in its occurrence and encompasses accidental events such as transport accidents, falls, poisoning and drowning, as well as intentional events such as physical assaults and self-inflicted injuries (2).

External causes are related to a large number of deaths in practically every country, always as the second or third cause of death, and are the main cause of mortality, morbidity and permanent disability in children and adolescents in developed countries (3-6). In Brazil, in spite of all advances of medicine and public health in the recent years, many children and adolescents die of avoidable causes, which pose an important public health problem (7).

porasta broja smrti zbog vanjskih uzroka, s najvećim udjelom prometnih nesreća i ubojstava od nasilnih oblika smrti (8).

Porast nasilnih smrti među djecom i adolescentima se pripisuje ne samo prometnim nesrećama i ubojstvima, nego i fizičkim napadima, koji postaju jedna od najčešćih pojava u brazilskom društvu (9).

Ozljede glave i vrata bile su najčešći tip ozljeda kod raznih nesreća, koje su liječene u hitnim službama (10) i one koje su zahtijevale bolničko liječenje (11), pogotovo među slučajeva sa smrtnim ishodom (12). Iz navedenog proizlazi da nije dovoljno poznavati prirodu ozljeda, već je potrebno odrediti njen uzrok radi određivanja i predviđanja situacija društvene ranjivosti (13).

Vanjski uzroci predstavljaju težak ekonomski i društveni teret, uključujući bolničke troškove (14). Premda su podaci o smrtnosti važni za otkrivanje kako nasilje utječe na populaciju, odražava se i na njihov život i uvjete života te može pridonijeti razvoju preventivnih djelovanja u različitim područjima ovisno o običajima pojave nasilja, kao i planiranju pružanja socijalne pomoći.

Demografski trendovi, socioekonomski i zemljopisni faktori rizika, opisani u literaturi, ili su prespecifični za pojedino područje, ili preopćeniti da bi bili od koristi za stvaranje strategija borbe protiv ovih tipova mortaliteta (15).

Cilj ovog istraživanja bio je procijeniti mortalitet djece i adolescenata zbog vanjskih uzroka kao i prisutnost maksilofacijalnih ozljeda kod žrtava.

Materijali i metode

Presječno i retrospektivno istraživanje provedeno je u gradu Campini Grande, koji je smješten u području Agreste pokrajine Paraíba State, u istočnom dijelu Borborema plateaua na sjeverozapadu Brazila. Grad ima 379871 stanovnika te Human Development Index (HDI) (16) iznosi 0,72. Podaci su prikupljeni iz spisa Odjela forenzične medicine. Skupljeni podaci potječu od specijalističkih medicinskih i dentalnih izvještaja dobivenih od sudskih vještaka, policijskih izvještaja i smrtoznica koje su zapisane na specifičnim formularima. Od ukupno pregledanih 837 izvještaja autopsije napisanih 2003. godine, u ovo istraživanje je uključeno 115 izvještaja (13,7%) koji su se odnosili na djecu i adolescente od 0 do 18 godina, koji su potvrđeno umrli od vanjskih uzroka.

Analizirane su sljedeće varijable: spol, starosna skupina, datum i sat nesreće, namjera smrti (ovisno je li bila namjerna (samoubojstva i ubojstva) ili nenamjerna (nesreće)), uzrok smrti, broj i vrsta ozljeda, kao i područje ozljeda na tijelu. Vrijeme nesreće je podijeljeno u četiri smjene: jutro (od 6:00 do 11:59), poslije podne (od podneva do 17:59), noć (od 18:00 do 23:59) i zora (od ponoći do 5:59). Uzrok smrti je bilježen po Međunarodnoj klasifikaciji bolesti i zdravstvenim problemima, 10. revizija, (ICD-10), volumen 1, poglavlje XX: Prometne nesreće (V01-V99), opekline (X00-X19), slučajna otrovanja (X40-X49), napadi (X85-Y09), padovi (W00-W19), izlaganje neživim mehaničkim silama (W20-W49), izlaganje živim mehaničkim silama (W50-W64), slu-

In a study conducted in 1971 and 1991 within 15 countries in the Americas, Brazil was one of the countries that exhibited a tendency to increasing death rates due to external causes, with transport accidents and homicides appearing as the outstanding causes of violent deaths (8). The increasing rates of violent deaths among children and adolescents are due not only to transport accidents and homicides, but also to physical assault, which is turning out as one of the most common violent practices in Brazilian society (9).

Injuries to the head and neck were the most common in various types of accidents among victims treated at emergency rooms and those who needed hospitalization, particularly in fatal cases (10-12). Therefore, knowing the nature of the injury is not sufficient; it is necessary to specify its cause in order to identify and foresee situations of social vulnerability (13).

The external causes impose heavy economic and social burdens, including hospital expenses (14). Thus, data on mortality are important to elucidate how violence affects the population, reflecting their living and health conditions and may contribute to the development of preventive measures in different areas related to violent practices, as well as to the planning of social assistance activities.

The demographic trends, the socioeconomic and geographic risk factors reported in the literature are either very specific for a given region or too generalized to be helpful for creating strategies against this type of mortality (15).

The aim of this study was to evaluate the mortality of children and adolescents due to external causes as well as the presence of maxillofacial injuries in victims.

Materials and Methods

A cross-sectional and retrospective study was performed in the city of Campina Grande, which is located in the Agreste region of the Paraíba State, in the eastern region of the Borborema plateau in the Brazilian northwest region. The city has an estimated population of 379,871 inhabitants and a 0.72 Human Development Index (HDI) (16).

The data were collected from the files of the Department of Forensic Medicine. Information collected from the expert medical and dental reports derived from medical forensic examinations, police reports, and death certificates was registered in specific forms. From a total of 837 autopsy records issued in 2003, the study sample consisted of 115 reports (13.7%) referring to children and adolescents aged 0 to 18 years who evidently died from external causes.

The following variables were analyzed: gender, age group, date and hour of the accident, intent of death (whether intentional [suicides and murders] or unintentional [accidents]), cause of death, number and type of injuries, as well as the injured region of the body. The time of accident was classified in four shifts: morning (from 6:00 to 11:59 a.m.), afternoon (from noon to 5:59 p.m.), night (from 6:00 to 11:59 p.m.) and dawn (from midnight to 5:59 a.m.). The causes of death were encoded according to the International Classification of Diseases and Related Health Problems, 10th revision, (ICD-10), volume 1, chapter XX: Transport accidents (V01-V99), Burns (X00-X19), Accidental Poison-

čajna utapljanja i potapljanja (W65-W74) i slučajevi neodređene namjere (Y10-Y34). Potvrda istraživanja je učinjena u usporedbi s podacima iz autopsijskih izvještaja, koji su uzeti kao zlatni standard istraživanja.

Statistička analiza

Sve statističke analize obavljene su s pomoću Epi-Info 3.4.1 programskog paketa (Centers for Disease Control and Prevention, Atlanta, GA, USA). Postojanje statistički značajne povezanosti između zavisnih i nezavisnih varijabli je potvrđeno s pomoću Hi-kvadrata i Fisherova egzaktnog testa, uzевši vrijednost $p < 0.05$ za odbacivanje nul hipoteze. Za par varijabli koje predstavljaju statistički značajnu povezanost (spol prema mortalitetu od vatrenog oružja i prometne nesreće prema postojanju maksilofacijalnih ozljeda) izračunat je omjer prevalencije (PR).

Rezultati

Mortalitet je bio veći među dječacima (70,4%) u rasponu od 14 do 18 godina (50,3%), s aritmetičkom sredinom starosti 11,81 ($\pm 5,89$) godina i omjerom muške u odnosu na žensku djecu 2,4:1. Uspoređujući starosne skupine ovi omjeri su bili kod djece 0 do 3 god. 1,1:1, kod skupine od 4 do 8 godina 1,5:1, za adolescente od 9 do 13 godina 2,1:1, i skupinu adolescenata od 14 do 18 godina 3,7:1. Nije utvrđena statistički značajna povezanost ($p=0,149$) između starosne skupine i spola, Tablica 1.

Između 105 izvještaja gdje je zabilježen dan u tjednu 46 (43,8%) slučajeva se dogodilo za vrijeme vikenda (subota ili nedjelja). Pregledom 94 izvještaja koji su imali zabilježena vremena nastanka ozljeda ustanovilo se da se većina dogodila poslije podne (41,5%), 23,4% ujutro, 22,3% noću i 12,8% u zoru, bez statistički značajne povezanosti ($p=0,945$) između vremena smrti i spola. Što se tiče namjere uzrokovanja smrti, 70% smrtnih slučajeva bilo je posljedica nenamjernog čina, tj. nesreća, a 30% su bili namjerno uzrokovane smrti, samoozljeđivanja ili ozljede nanesene od nekog drugog.

Tablica 2 prikazuje distribuciju žrtava ovisno o uzroku smrti i starosti. Najčešći uzrok ozljeda bile su prometne nesreće (32,2%). Većina slučajeva bili su naleti na pješake (37,8%), te automobilski sudari (32,4%) te nesreće s motorima (29,7%). Ozljede vatrenim oružjem bile su glavni uzrok smrti adolescenata od 14 do 18 godina starosti (87,5%). Sve traume povezane s nasiljem (fizički napadi i ozljede oštrim predmetom) su se dogodile kod adolescenata starijih od 14 godina.

Bivarijantna analiza između uzroka smrti i spola je otkrila pozitivnu povezanost između varijabli spola i smrti od vatrenog oružja, gdje su muški 4,6 puta više skloni zadobivanju ozljeda vatrenim oružjem nego ženski adolescenti, Tablica 3. Povezanost između spola i ostalih vrsta uzroka smrti nije uočena.

Sedamdeset i devet žrtava (68,7%) je imalo ozljede više regija tijela u trenutku autopsije i među njima 87,3% je ima-

ing (X40-X49), Assaults (X85-Y09), Falls (W00-W19), Exposure to Inanimate Mechanical Forces (W20-W49), Exposure to Animate Mechanical Forces (W50-W64), Accidental Drowning and Submersion (W65-W74) and Events of Undetermined Intent (Y10-Y34). Study validation was made by comparing the data from the autopsy records, chosen as the gold standard for the study.

Statistical Analysis

All statistical analyses were performed using the Epi-Info 3.4.1 software (Centers for Disease Control and Prevention, Atlanta, GA, USA). The existence of significant association between the dependent and independent variables was verified by the Chi-square and Fisher's exact test, considering a value of $p < 0.05$ for rejection of the null hypothesis. For the pairs of variables that presented statistically significant association (gender *vs* mortality by firearms and transport accidents *vs* presence of maxillofacial injuries) was calculated the prevalence ratio (PR).

Results

Mortality was greater among boys (70.4%) in the 14-18-year-old range (50.3%), with a mean age of 11.81 (± 5.89) years and 2.4:1 male-to-female ratio. Comparing the age groups, this ratio was 1.1:1 for children aged 0 to 3 years, 1.5:1 for children aged 4 to 8 years, 2.1:1 for adolescents aged 9 to 13 years and 3.7:1 for adolescents aged 14 to 18 years. No statistically significant association ($p=0.149$) was observed between age group and gender, Table 1.

Out of the 105 reports where the weekday was recorded, 46 (43.8%) cases occurred during the weekend (Saturday and Sunday). Review of the 94 reports that presented time of death showed that most cases occurred in the afternoon (41.5%), 23.4% in the morning, 22.3% at night and 12.8% at dawn, without statistically significant association ($p=0.945$) between time of death and gender.

Regarding the intent of death, 70% of the deaths resulted from unintentional acts, that is, accidents, and 30% were intentional acts, either self-inflicted or inflicted by someone else.

Table 2 shows the distribution of victims according to the cause of death and age. The leading major cause of injury was transport accidents (32.2%). Most cases were fatal pedestrian crashes (37.8%) followed by automobile collisions (32.4%) and motorcycle accidents (29.7%). Firearms wounds were the most common causes of death in adolescents of 14 to 18 years (87.5%). All violence-associated trauma (physical assaults and sharp object wound) occurred in adolescents older than 14 years.

Bivariate analysis between the death cause and gender revealed a positive correlation between the variables gender and death by firearm, with men being 4.6 times more susceptible to penetrating firearm wounds than women, Table 3. Associations between gender and other types of causes of death were not observed.

Seventy-nine (68.7%) victims had injuries in multiple regions of the body at the moment of autopsy and among those, 87.3% had multiple injuries involving more than one

Tablica 1. Distribucija žrtava ovisno o starosti i spolu.
Table 1 Distribution of the victims by age group and gender

Starosna skupina • Age group	Spol • Gender				Ukupno • Total		p vrijednost* • p value*
	Muški • Male		Ženski • Female		n	%	
	n	%	n	%			
0 - 3	9	11.1	8	23.5	17	14.8	p=0.149
4 - 8	9	11.1	6	17.6	15	13.0	
9 - 13	15	18.8	7	20.6	22	19.1	
14 - 18	48	54.3	13	38.2	61	53.0	
Ukupno • Total	81	70.4	34	29.6	115	100.0	

* hi-kvadrat test • Chi-square test.

Tablica 2. Distribucija žrtava ovisno o uzroku smrti i starosti.
Table 2 Distribution of victims according to the cause of death and age

Uzrok smrti • Cause of Death	Starosna skupina • Age Group								Ukupno • Total	
	0 - 3		4 - 8		9 - 13		14 - 18		n	%
	n	%	n	%	n	%	n	%		
Prometna nesreća • Transport accident	3	8.1	6	16.2	6	16.2	22	59.5	37	32.2
Utopljanje • Drowning	7	23.3	7	23.3	7	23.3	9	30.1	30	26.1
Fizički napad • Physical assaults	0	0.0	0	0.0	0	0.0	3	100.0	3	2.6
Ozljede oštrim predmetom • Sharp object wound	0	0.0	0	0.0	0	0.0	2	100.0	2	1.7
Ozljede vatrenim oružjem • Firearm wound	1	4.2	0	0.0	2	8.3	21	87.5	24	20.9
Vješanje • Hanging	0	0.0	0	0.0	2	66.7	1	33.3	3	2.6
Otrovanja kemijskim tvarima i lijekovima • Poisoning by chemical substances and drugs	0	0.0	0	0.0	0	0.0	2	100.0	2	1.7
Neodređeno • Undetermined	2	50.0	0	0.0	1	25.0	1	25.0	4	3.5
Opekline • Burns	0	0.0	1	100.0	0	0.0	0	0.0	1	0.9
Padovi • Falls	0	0.0	0	0.0	4	100.0	0	0.0	4	3.5
Ostalo* • Other*	4	80.0	1	20.0	0	0.0	0	0.0	5	4.3
Ukupno • Total	17	14.8	15	13.0	22	19.1	61	53.0	115	100.0

* Ova kategorija uključuje tri slučaja koja se nisu uklapala u bilo koji od gore navedenih uzroka te dva slučaja bez poznate etiologije. • This category included three cases that did not fit in any of the above causes and two death cases of non-reported etiology.

Tablica 3. Povezanost između spola žrtve i mortaliteta od vatrenog oružja.
Table 3 Correlation between the victim's gender and mortality due to firearms

Spol • Gender	Mortalitet od vatrenog oružja • Mortality by firearms				Ukupno • Total		PR IC95%
	Da • Yes		Ne • No		n	%	
	n	%	n	%			
Muški • Male	22	91.7	59	64.8	81	70.4	4.6
Ženski • Female	2	8.3	32	35.2	34	29.6	
Ukupno • Total	24	20.9	91	79.1	115	100.0	

* PR: Omjer prevalencije. Yates' hi-kvadrat test; p=0.020 • PR: Prevalence ratio. Yates' Chi-square test; p=0.020

Tablica 4. Povezanost između prometnih nesreća i maksilofacijalnih ozljeda.
Table 4 Correlation between transport accidents and presence of maxillofacial injuries

Prometne nesreće • Transport accidents	Nazočnost maksilofacijalnih ozljeda • Presence of maxillofacial injuries				Ukupno • Total		PR IC95%
	Da • Yes		Ne • No		n	%	
	n	%	n	%			
Da • Yes	28	75.7	9	24.3	37	32.2	2,9
Ne • No	20	25.6	58	74.4	78	67.8	
Ukupno • Total	48	41.7	67	58.3	115	100.0	

* PR: Omjer prevalencije. Yates' hi-kvadrat test; p=0.000 • PR: Prevalence ratio. Yates' Chi-square test; p=0.000

lo višestruke ozljede uključujući više od jedne regije i/ili više od jednog tipa ozljede. Nije ustanovljena statistički značajna razlika ($p=0,103$) između spola i broja ozljeda (jednostruka ili višestruka). Između 330 ozljeda koje su nađene kod žrtava, bilo je ogrebotina (39,4%), rana (24,5%), fraktura (19,1%), edema (5,5%), ahimoza (4,5%), hematoma (4,3%) i kontuzija (0,6%). Ostale ozljede činile su 2,1% i bile su na primjer opekline i slično.

Najčešće su bile ozljede glave i lica i nađene su u 22,5% glave i 20,4% lica, slučajeva. Druga ozlijeđena područja tijela su bila grudni dio (14,1%), gornji udovi (13,2%), leđa (10,2%), donji udovi (10,2%), abdomen (6,0%) i vrat (3,4%).

Maksilofacijalne ozljede su identificirane kod 48 (41,7%) žrtava, s većom incidencijom laceracija mekog tkiva (87,5%). Šest žrtvi (12,5%) imalo je maksilofacijalne frakture, uključujući sljedeće lične kosti: mandibula (37,5%), orbitalno-zi-gomatični kompleks (25,0%), nosne kosti (25,0%) i maksila (12,5%). Ozljede oralne sluznice zabilježene su u 9,6% žrtava, gdje je većina (90,9%) bila laceracija mekih tkiva lokalizirana većinom u gornjoj usnici (50%).

Bivarijantna analiza između prometnih nesreća i maksilofacijalnih ozljeda (Tablica 4) otkrila je statistički značajnu povezanost ($p=0,000$), u kojoj žrtve prometnih nesreća imaju 2,9 puta veću vjerojatnost za dobivanje ozljeda maksilofacijamog područja. Nije nađena značajna povezanost između maksilofacijalnih ozljeda i drugih uzroka smrti.

Rasprava

Pojava smrti zbog vanjskih uzroka ovisi o osobnim čimbenicima, kao spol i starost, te o posebnim karakteristikama različitih država i kultura, koji određuju profile rizika i sklonost nesrećama (3). U Brazilu je glavni uzrok morbiditeta od 1970.-ih nasilje. To je pokrenulo veliku zabrinutost u zdravstvenom području te postajući postupno od socijalnog i forenzičkog problema u problem javnog zdravstva (17).

Podaci u ovom istraživanju prikupljeni su iz izvještaja medicinskih vještaka i stomatoloških izvještaja koji su izdvojeni iz medicinskih forenzičnih pregleda, ali su pri tome neki izvještaji bili nepotpuni. Nepotpuna informacija stvara nepouzdan rezultate, te su dodatno pregledani kako policijski izvještaji tako i smrtovnice. Unatoč tome neki podaci nisu se mogli pronaći. O netočnosti i nepotpunosti podataka u forenzičnim izvještajima već je opširno pisano (18). Osobe koje su odgovorne za bilježenje podataka u slučajevima nasilnih smrti; tj. policijski činovnici (ispunjava policijski izvještaj), medicinski sudski vještak (provodi autopsiju) i forenzični činovnik (odgovoran za unošenje podataka iz izvještaja stručnjaka), treba upozoriti na važnost unošenja potpunih i točnih podataka za službenu dokumentaciju i izradu statističkih podataka. Uzevši u obzir stopu mortaliteta odmah se uočava da smrt zbog vanjskih uzroka pogađa prvenstveno mušku populaciju svih starosnih skupina (3, 19). Objašnjenje ove činjenice, posebno u Brazilu, temelji se na velikim socioekonomskim razlikama povezanim s povijesno seksističkom latinoameričkom kulturom u kojoj muške dominiraju

region and/or more than one type of injury. No statistically significant difference ($p=0,103$) was observed between gender and number of injuries (single or multiple). Among the 330 injuries observed in the victims, there was a prevalence of bruises (39.4%), followed by wounds (24.5%), fractures (19.1%), edemas (5.5%), ecchymoses (4.5%), hematomas (4.3%) and contusions (0.6%). Other injuries totaled 2.1% and included burns, for example.

Injuries to the head and face were the most common, being found in 22.5% and 20.4% of the cases, respectively. Other injured regions of the body were the thorax (14.1%), upper limbs (13.2%), dorsum (10.2%), lower limbs (10.2%), abdomen (6.0%) and the neck (3.4%).

Maxillofacial injuries were identified in 48 (41.7%) victims, with higher incidence of soft tissue lacerations (87.5%). Six victims (12.5%) exhibited maxillofacial fractures, involving the following facial bones: the mandible (37.5%), orbital-zygomatic complex (25.0%), nasal bone (25.0%) and the maxilla (12.5%). Oral injuries were observed in 9.6% of the victims, most of them (90.9%) being soft-tissue lacerations located mainly on the upper lip (50%).

Bivariate analysis between transport accidents and presence of maxillofacial injuries (Table 4) revealed a statistically significant association ($p=0,000$), in which victims of transport accidents presented a 2.9 times higher chance of suffering injuries to the maxillofacial region. No correlation was found between the presence of maxillofacial injuries and all other causes of death.

Discussion

The occurrence of death due to external causes depends on personal factors, such as gender and age, as well as on the characteristics inherent to different countries and cultures, which determine the risk profiles and accident susceptibility (13). In Brazil, violence has been pointed out as the main cause of morbimortality since the 1970's. It has raised great concern in the health field by gradually shifting from a social and forensic problem to a public health problem (17).

The data for this study were supposed to be collected from expert medical and dental reports derived from medical forensic exams, but several reports were incomplete. As incompleteness of information could provide unreliable results, the police reports and death certificates were also reviewed. In spite of this, some data could not be retrieved. The incompleteness or inaccuracy of data registered in forensic reports has been reported (18). Professionals who are responsible for data recording in cases of violent deaths, that is, the police clerk (who fills out the police report), the forensic medical expert (who performs the autopsy) and the forensic clerk (responsible for entering the expert's report data), should be warned of the importance of providing complete and accurate data as these documents are necessary for documenting official statistics.

Regarding the mortality rates, an immediate fact that calls the attention is that death due to external causes affects predominantly the male population, in all age groups (3,19). An explanation for this fact, particularly in Brazil, is based on

će strukture te društvena ugovaranja još uvijek prevladavaju nad ženskom populacijom.

Ove karakteristike temelj su za veću ranjivost muške populacije za sudjelovanje u nasilnim radnjama, bilo kao žrtva, bilo kao počinitelj (20).

Rezultati ovog istraživanja upućuju na značajnu prevalenciju smrti kod muškaraca zbog vanjskog uzroka (70,4%), koja potvrđuje rezultate prethodnih istraživanja diljem svijeta (21-23). U jednom prethodnom istraživanju u Brazilu naveden je podatak od 86,7% prevalencije smrti među muškim pojedincima, od kojih je 82,0% bilo od 15 do 19 godina starosti (24), što se slaže s podatkom prevalencije od 53,0% među adolescentima od 14 do 18 godina u ovom našem istraživanju. Smrti su prvenstveno nastupile poslije podne tijekom radnih dana u tjednu. Budući da su smrtni ishodi bili prometne nesreće naleta na pješake, ovaj rezultat može se objasniti većim brojem pješaka i motornih vozila na ulicama. Prethodno istraživanje provedeno u ovom gradu upozorilo je na veliki broj motora u lokalnom voznom parku (18).

U ovom istraživanju, namjerne smrti (30,0%) su značajno rjeđe u odnosu na namjerne smrti među djecom u Estoniji u dobi od 0 do 14 godina starosti (80%) (23). Kod ozljeda kod kojih namjera nije otkrivena pokazalo se da je to najveći problem kod žrtava obaju spolova (19).

Prometne nesreće i utapljanja najčešći su uzroci smrti zbog vanjskih faktora navedeni u literaturi (23, 25-28), a ti rezultati su potvrđeni u ovom istraživanju (32,2% za prometne nesreće i 26,1% za utapljanje). Mora se uzeti u obzir i da ubojstva mogu postati glavni uzrok mortaliteta (3, 29).

Za razliku od zemalja u razvoju, gdje su većina prometnih nesreća sa smrtnim ishodom nastupila zbog sudara vozila, u Brazilu je glavni razlog mortaliteta prometnih nesreća nalet motornih vozila na pješake (30), što znači da bi preventivne mjere za smanjenje ovog mortaliteta trebale uzeti u obzir specifične faktore u sudarima pješaka i vozila (24).

U ovom istraživanju, gdje su većina žrtava bili pješaci (37,8), dobiven je rezultat sličan prethodnim istraživanjima (31, 32). Poznajući različite vrste prometnih nesreća može pružiti važne smjernice za sastavljanje preventivne strategije za takve smrti jer su djelovanja za izbjegavanja pješaka različita od onih koja se odnose na ozljede i smrt od sudara vozila (3).

Povećanje mortaliteta od vatrenog oružja kroz vrijeme i veličina stopa smrtnosti odražavaju veliku ranjivost adolescenta, pretežno muškaraca od 15 do 19 godina. Na žalost, ovi podaci u porastu opaženi su u mladoj populaciji diljem svijeta i mogu se pripisati kombinaciji lake dostupnosti vatrenog oružja, razlikama u ulogama pojedinog spola, društvenoj neorganizaciji i kulturi nasilja (19). Skupina od 15 do 19 godina starosti najjače je pogođena, za njom slijede mladi odrasli te djeca od 10 do 14 godina (33). Bivarijantna analiza između spolova žrtava i pojavnosti ozljeda od vatrenog oružja pokazala je da muškarci imaju 4,6 puta veću šansu da postanu žrtve nego žene.

Analiza izvještaja medicinskih vještaka je da su žrtve imale višestruke ozljede, ali nije utvrđena statistički značajna povezanost između spola žrtve i broja ozljeda. Među vrstama ozljeda, prevladavaju modrice. Potrebno je spomenuti da ni-

the great socioeconomic inequalities allied to a historically sexist Latin culture in which male-dominated structures and social arrangements still prevail over the female population. These characteristics are the background for the greater vulnerability of the male population to get engaged in violent practices, either as a victim or as perpetrator (20).

The results of this study point to a significant prevalence of death of men due to external causes (70.4%), which corroborates the results of previous studies worldwide (21-23). An earlier Brazilian study reported an 86.7% prevalence of death among male individuals, 82.0% of them aged 15 to 19 years old²⁴, which concurs with the 53.0% prevalence involving adolescents aged 14 to 18 years found in this study.

The deaths occurred predominantly in the afternoon during working days. As most fatalities were caused by transport accidents involving pedestrians, this result can be explained by the larger number of pedestrians and motor vehicles in the streets. A previous study performed in this city pointed to the large number of motorcycles in the local motor vehicle fleet (18).

In this study, intentional deaths (30.0%) were considerably less frequent than those observed among Estonian children aged 0 to 14 years (80%), (23). The injuries in which the intent of death was not discovered showed to be the greatest problem to the victims of both genders (19).

Transport accidents and drowning are the most common causes of death due to external factors reported in the literature (23-28), and these results were confirmed in the present study (32.2% for transport accidents and 26.1% for drowning). Nevertheless, homicides may become the main cause of mortality (3-29).

Unlike developed countries, where most fatal traffic accidents are due to vehicle collisions, pedestrian crashes are the main cause of fatal victims of traffic accidents in Brazil, which means that preventive measures aimed at decreasing this mortality rate should consider the specific factors involved in pedestrian-versus-vehicle crashes (24,30). In this study, most victims were pedestrians (37.8%), a result similar to the findings of previous studies (31,32). Knowledge of different types of traffic accidents can provide an important guidance for the establishment of preventive policies of such deaths because measures to avoid pedestrian crashes, for example, must be different from those addressing injuries and deaths due to vehicle collisions (3).

Over time, the increase of mortality due to firearms and the magnitude of death rates have reflected a great vulnerability of adolescents; mainly males aged 15 to 19 years. Unfortunately, these results have been observed at growing levels in young population worldwide and they can be attributed to the combination of easy access to firearms, differences in gender roles, social disorganization and culture of violence (19). The 15-19-year-old age group is the most affected followed by the young adults and children aged 10 to 14 years (33). The bivariate analysis between the victim's gender and occurrence of injuries due to firearms showed that men have a 4.6 times greater chance to become victims than women.

Analysis of the expert medical reports revealed that the victims had multiple injuries, but no statistically significant correlation was found between the victim's gender and the

je moguće provesti komparativnu analizu s prethodnim istraživanjima zbog manjka sličnih istraživanja u ustanovama brazilske forenzične medicine s podacima o djeci i adolescentima kao žrtvama nasilnih smrti. Sa stajališta forenzične medicine, naši rezultati su vrijedni jer opisuju tipove ozljeda zbog vanjskih uzroka nanesenih maloljetnim žrtvama.

Prikazano je da je glava najčešće pogođeno područje bilo kod fatalnih (15, 21, 28) ili kod ne fatalnih žrtava (10, 11) zbog vanjskih uzroka, potvrđuju rezultati ovog istraživanja. Nalazi istraživanja su također potvrdili da je pojavnost teških maksilofacijalnih ozljeda kod djece i adolescenata ograničena (41.7%) te je obično posljedica razderotina mekih tkiva uz nisku stopu fraktura ličnih kostiju (10, 34), jer su pronađene samo kod šest žrtava.

Najpogođenije lične kosti su bile mandibula, te kosti orbitalno-zigomatičnog kompleksa što je u suglasju s prethodnim rezultatima (11, 35-37).

Bivarijantna analiza između prometnih nesreća i maksilofacijalnih ozljeda (Tablica 4) pokazala je statistički značajnu povezanost ($p < 0.01$), jer su žrtve prometnih nezgoda 2,9 puta sklonije maksilofacijalnim ozljedama. Nije ustanovljena povezanost maksilofacijalnih ozljeda s bilo kojim drugim uzrokom smrti.

Zabilježeno je malo oralnih ozljeda, uglavnom razderotine mekih tkiva, većinom gornje usne, opisane i u drugim istraživanjima (14). Činjenica da je gornja usna najisturenija anatomska struktura područja može objasniti ovaj rezultat.

Visok mortalitet zbog prometnih nezgoda i ubojstava u gradu Campini Grande upozoravaju na hitnu potrebu preoblikovanja lokalnog javnog zdravstva i sigurnosne protokole radi pružanja bolje hitne pomoći žrtvama i razvijanja preventivnih i edukativnih mjera uključujući pješake i vozače motornih vozila kako bi se smanjili navedeni uzroci smrti (18). Distribucija smrti zbog vanjskih uzroka u Brazilu ima iste karakteristike kao i u drugim zemljama, ali također posjeduje svoju posebitost i čudan aspekt. Ovi aspekti moraju se dobro razumjeti radi suočavanja s problemom (30) jer profili rizika variraju ovisno o vanjskim uzrocima smrti bez obzira na pojedinosti svake regije (27).

Zaključak

Dječaci od 14 do 18 godina bili su najčešće žrtve vanjskih uzroka sa smrtnim ishodom, većinom prometnih nesreća te je pojava višestrukih ozljeda glave i lica bila učestala.

Zahvale

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number of injuries. Among the types of injuries, a prevalence of bruises was observed. It is worth mentioning that no comparative analysis could be done with previous investigations due to the lack of similar studies undertaken in Brazilian Forensic Medical institutes with data from children and adolescents victims of violent deaths. Nevertheless, from a forensic medical standpoint, our results are extremely valuable because they characterize the type of injuries due to external causes inflicted to underage individuals.

Involvement of the head as the most commonly affected region in non-fatal^{10,11} and fatal victims of injuries due to external causes has been demonstrated, corroborating the findings of the present study, in which most injuries occurred in the head (22.5%) and the face (20.4%), (15,21,28).. The findings also confirmed that the occurrence of severe maxillofacial injuries is limited in children and adolescents (41.7%) and they generally result in soft tissue lacerations, with low rates of facial bone fractures, occurring in only six victims. The most affected facial bones were the mandible, followed by the bones of the orbital-zygomatic complex, which agrees with previous results (10,11, 34-37).

The bivariate analysis between transport accidents and presence of maxillofacial injuries (Table 4) showed a statistically significant correlation ($p < 0.01$), as the victims of transport accidents are 2.9 times more susceptible to maxillofacial injuries. No correlation was established between the maxillofacial injuries and the other causes of death.

Few cases of oral injuries were recorded, most of them being soft tissue lacerations, mainly on the upper lip, as reported elsewhere (14). The fact that the upper lip is a prominent anatomic region can explain this result.

The high mortality rates by transport accidents and homicides in the city of Campina Grande point to an urgent need of reformulating the local public health and security policies in order to provide better emergency care to the victims and develop preventive and educational measures involving pedestrians and motor vehicle drivers in an effort to reduce deaths due to these causes (18). The distribution of deaths due to external causes in Brazil has the same characteristics observed in other countries, but also has its own specific and peculiar aspects. These aspects must be well understood in order to face the problem because the risk profiles probably vary according to the external causes of death regardless of the particularities of each region (27,30).

Conclusion

Boys aged 14 to 18 years were the main victims of fatalities due to external causes, mainly traffic accidents, and the occurrence of multiples injuries to the head and face was frequent.

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Abstract

Objective: In this study, mortality by external causes of children and adolescents and the occurrence of maxillofacial injuries was evaluated in the city of Campina Grande, PB, Brazil in 2003. **Methods:** 837 forensic medical reports were reviewed, 115 (13.7%) of them belonging to victims aged from 0 to 18 years. The causes were classified according to the Chapter XX of the International Classification of Diseases - CID 10. Data were organized using Epi-Info 3.4.1 software. The association of the variables: type of cause and maxillofacial injuries as dependent variables and sex and age as independent variable was performed by the chi-square and Fisher's exact tests ($p < 0.05$). **Results:** Higher mortality was observed among boys (70.4%) and in the 14-18-year-old age group (50.3%), although without statistically significant difference between the age groups and the genders ($p = 0.149$). There was a predominance of traffic accidents (32.2%), most involving pedestrians (37.8%). Males had a 4.6 times greater chance of being victims of firearms than females. Most of the victims had multiple injuries, with predominance of abrasions (39.4%) and wounds (24.5%). The prevalence of injuries to the head and face was 22.5% and 20.4%, respectively. Maxillofacial injuries were identified in 41.7% of the victims. Six victims (12.5%) exhibited fractures, mainly in the mandible (37.5%). Victims of traffic accidents had a 2.9 times greater chance of suffering injuries to the maxillofacial region. **Conclusion:** Boys aged between 14 and 18 years were the main victims of fatalities due to external causes, mainly traffic accidents, and the occurrence of multiples injuries to the head and face was frequent.

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Key words

Mortality; Accidents, Traffic; Firearms;
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