



## RESULTS

The study divides injuries of children into three groups. The first group covers single injuries that in 1995 constituted 68.4% of all injuries. The second group covers multiple injuries constituting 22.9% of all injuries in that year. The third group of injuries covers burns - 8.7% of all injuries. In 1996 single injuries constituted 72.8%, multiple injuries 15.9% and burns 11.2%. In 1997 - 78.8%, 11.6%, and 9.6% respectively. Detailed data are presented in Table 1.

Table 1. Types of body injuries suffered by children in the examined population

Year	Single injuries		Multiple injuries		Burns		Total
	n	%	n	%	n	%	
	%		%		%		
1995	212	68.39%	71	22.90%	27	8.71%	310
	28.04%		41.76%		26.47%		30.16%
1996	266	72.88%	58	15.89%	41	11.23%	365
	35.19%		34.12%		40.20%		35.50%
1997	278	78.75%	41	11.61%	34	9.63%	353
	36.77%		24.12%		33.33%		34.34%
Total	756 (73.54%)		170 (16.54%)		102 (9.92%)		1028
Comparison			$\chi^2$		p		
1995 - 1996			5.8502		p>0.05		
1995 - 1997			15.0031		p<0.001		
1996 - 1997			3.377		p>0.1		

The causes of accidents in which children suffered from multiple body injuries were divided into the following categories: hitting by a car - 56 cases constituting 32.9% of the examined population of children with multiple body injuries, passive participation in a car crash as a passenger - 25 children (14.7%), a fall from a height - 31 persons (18.2%), a horizontal fall - 31 persons (18.2%), beating - 10 children (5.8%), a dog's bite - 4 persons (2.3%), other causes - 13 persons (7.6%).

Table 2. Causes of accidents in multiple location injuries

	Participation in a car crash	Fall from the height	Horizontal hall	Beating	Dog's bite	Hitting by a car	Other	Total
Number of children	25	31	31	10	4	56	13	170
%	14.71%	18.24%	18.24%	5.88%	2.35%	32.94%	7.65%	100%

Table 3. Place of accident in which the child suffered from multiple body injuries

Place of accident	Street	School	Home	Playground	Other
Number of children	81	8	23	45	13
%	47.6	4.7	13.5	26.4	7.6

Most often the place of accident in which the child suffered from multiple body injuries was the street (47.6%), playing grounds for children such as the yard, sports field (26.4%), home (13.5%), other places not included in the above mentioned categories (7.6%).

Most often multiple injuries affected children at the age of 12 (13.5%). The smallest number of such injuries were observed in the group of 2-year-old children (1.8%). Detailed data are presented in Table 4:

Table 4. Age of patients with multiple body injuries

Age of patients	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Number of patients	6	3	9	10	10	9	12	14	12	21	12	23	20	9	170
%	3.5	1.8	5.3	5.9	5.9	5.3	7.1	8.2	7.1	12.4	7.1	13.5	11.8	5.3	

Multiple located injuries concerned mainly the head and were accompanied by injuries of one or more organs. As regards location of the injuries the material was divided into injuries involving head injury and those without it. Taking into consideration the number of organs affected by injuries in the accident, multiple location injuries were divided into those in which two organs were damaged and injuries of three or more organs. Head injuries were found in 103 cases of simultaneous injury of two organs, which constituted 75.74% of injuries of two organs and 77.44% of multiple located head injuries. In case of injuries of three or more organs, head injuries occurred in 30 cases, which constituted 88.24% of injuries involving three organs, and 15.04% of head injuries. In total, head injuries were diagnosed in 133 cases, which constituted 78.24% of multiple location injuries. Head injuries did not occur in 33 cases of simultaneous injury of two organs, which constituted 24.26% of injuries of two organs and 89.19% of cases without head injury. In 4 cases of injuries of three and more organs, head injury was not diagnosed. It constituted 11.76% cases of injuries of more than two organs and 10.81% cases of multiple located injuries without head injury. In total, injuries of two organs were diagnosed in 136 cases, which constituted 80.0% of multiple location injuries, and injuries of three or more organs in 34 cases (20%).

Table 5. Location of multiple body injuries

Number of body injuries	Head injuries		Injuries without head injuries		Total
	n	%	n	%	
	%		%		
Injuries of two organs	103	75.74%	33	24.26%	136 80.0%
	77.44%		89.19%		
Injuries of three organs	30	88.24%	4	11.76%	34 20.0%
	15.04%		10.81%		
Total	133 (78.24%)		37 (21.76%)		170
$\chi^2$	510.00		p<0.001		

## DISCUSSION

By applying the above mentioned research method, a group of 1,028 children was chosen. In the research the majority of noted injuries were single ones - they regarded 73.5% of the tested population, and 16.5% children suffered from multiple injuries. What seems to be interesting is the fact that in subsequent years of the research we could

observe gradual decrease in the number of children suffering from multiple body injuries as opposed to isolated injuries. The research noted the biggest number of multiple injuries in the group of 12-year-old children. Many authors claim that accidents involve most often children at the age of 10 -13 years (7, 6) which this study also seems to confirm. The analysis of the place of accident in which the child suffered from multiple body injuries shows that as much as 47.6% of accidents took place in the street traffic. In many publications on the problem of child injury, road accidents are the main cause of injuries (14, 3, 9). In the presented study the second place as far as frequency of accidents is concerned, is occupied by places connected with children's play, such as playgrounds, yards or school sports fields. This kind of accidents could often be avoided if those places were carefully checked and equipped with technical protections. What is most important in preventing such accidents, however, is reason and imagination of the parents. A lot of such accidents could be avoided thanks to increased supervision over the child. In research of other authors (8) injuries that took place at home occupied the second place after injuries in the road traffic. In this study, however, home occupied the third place as far as frequency of accident occurrence is concerned (13.5%). Each year accidents at home are the cause of 1/3 of all post-accident deaths (10). The study states that the most rare place of accident was the school (4.7%), which proves good supervision over children in schools. The study also attempts to analyse the causes of accidents in which children suffer from multiple body injuries. It was found that the most frequent cause of an accident in which a child suffers from such injuries is hitting by a car. In all statistics the number of accidents as a result of hitting by a car always exceeds the number of accidents as a result of car crashes where children participate as passengers (11,2). The majority of lethal casualties as a result of accidents are pedestrians (5,12). This kind of accidents in Poland is the cause of 30% of deaths of children under the age of 14 (5). Safety of children in road traffic depends on many factors, such as preparing children to modern conditions of traffic and the organisation of the traffic itself, especially in the neighbourhood of schools, kindergartens and housing areas. As far as children are concerned, it is necessary to intensify the forms and means of educational influence, such as didactic classes with children and teenagers in schools and kindergartens, as well as training courses in the rules of road traffic organised on holiday camps. Organisation of competitions, events, contests in the field of traffic safety, or of other activities, special actions and preventive and propagating campaigns seem to be a good form of activities. Other important factors in limiting the number of such accidents are proper and visible road signs and marking of zebra crossings, good technical condition of roads, and following the road signs and traffic rules both by the drivers and pedestrians. The results of children's injuries are unfortunately often irreversible and the price the family and the child pay is incomparably high. Permanent disability makes the child dependent for the whole life on the help of the family and friends, and the costs of treatment or possible disability pension are born by the whole society. Children's injuries, due to their constantly increasing number, variety and related threat, are a major social problem requir-

ing undertaking effective steps. The importance of the problem is underlined by all authors dealing with this area, who treat children's injuries as a problem of social health, and stress that they can be treated as a real epidemic (4,6,13).

### CONCLUSIONS

1. The most frequent cause of accidents in which the child suffered from multiple body injuries was hitting by a car.
2. Most often the place of accident was street traffic.
3. Head injuries were the most frequent constituent of multiple body injuries.
4. Most often multiple body injuries occurred among of 12-year-old children.

### REFERENCES

1. Borowski M. et al.: Ciężkie obrażenia ciała. Pol. Prz. Chir., 55, 479, 1983r.
2. Brongel L., Gedliczka O.: Obrażenia ciała w badaniu prospektywnym III. Mechanizm urazu. Pol. Prz. Chir., 65, 693, 1993.
3. Dziak A.: Nieszczęśliwe wypadki i urazy u mieszkańców wsi. Pol. Tyg. Lek., 40, 1169, 1985.
4. Gedliczka O. et al: Obrażenia ciała w badaniu prospektywnym I. Cele i założenia pracy. Pol. Prz. Chir., 65, 451, 1993.
5. Gizińska H.: Wypadki drogowe w latach 1967 - 1978 z udziałem dzieci do lat 14. Społeczne zagadnienie wypadkowości dziecięcej. Materiały z XII jednodniówki. Red. S. Sobocki, KAW Warszawa 1985.
6. Góral R.: Stan i perspektywy leczenia urazowego w Polsce. Pol. Prz. Chir. 52, 461, 1980.
7. Kassur T. et al: Przyczyny i częstość urazów u dzieci. In: Doraźna pomoc w urazach u dzieci. Materiały z XII jednodniówki. Red. S. Sobocki, KAW, Warszawa 1985.
8. Klempeus J., et al: Epidemiologia urazów i obrażeń u dzieci w materiale oddziału Chirurgii dziecięcej Specjalistycznego Szpitala Zespołonego im. T. Marciniaka, wydziału ruchu drogowego Komendy Wojewódzkiej Policji i W. S. P. R. we Wrocławiu. In: Wybrane problemy urazów wielonarządowych. Red. J. Wroński, Fundacja Pol. Prz. Chir., Wrocław 1997.

9. Lipiński J. et al: Mnogie obrażenia ciała w następstwie w wypadków drogowych w materiale Kliniki Chirurgii Dziecięcej AM. W Gdańsku w latach 1977 - 79. Pol. Prz. Chir., 56, 199, 1984.
10. Lipiński J., Lasek J.: Uwagi dotyczące nazewnictwa w traumatologii. In: Wybrane problemy urazów wielonarządowych. Red. J. Wroński, Fundacja - Pol. Prz. Chir., Wrocław 1997.
11. Łodziński K. et al: Ocena aktualnej opieki medycznej nad dziećmi i młodzieżą po urazach. Probl. Chir. Dziec., 16, 27, 1990.
12. Modzelewski B. et al: Udzielanie pomocy w urazach. In: Organizacja zabezpieczenia medycznego katastrof i stanów nagłych. Red. R. Nowakowski. PZWL, Łódź 1997.
13. Rondio Z.: Dziecko ofiarą wypadku. In: Lekarz na miejscu wypadku. Red. B. Kamiński, A. Dziak. PZWL, Warszawa 1978.
14. Sobocki S.: Problemy urazów wielonarządowych u dzieci w Polsce. Rocznik Nauk Med., 10, 35, 1995.

Otrz.: 2000.09.20

## STRESZCZENIE

Materiał do pracy został zebrany na podstawie dokumentacji medycznej udostępnionej przez pogotowie ratunkowe oraz szpital. Jest to próba przedstawienia problemu występowania mnogich obrażeń ciała w aspekcie przyczyn, miejsca wypadku, w wyniku którego dziecko doznało obrażeń. W badaniu stwierdzono, że obrażenia o mnogiej lokalizacji dotyczyły 16,5% badanej populacji. Najczęstszymi obrażeniami były urazy głowy. Aż u 78,2% przypadków wystąpiły urazy głowy jako składowa mnogich obrażeń ciała.

