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Badania stanu zdrowia kierowców wykonywane na podstawie *Prawa o ruchu drogowym* w Podlaskim Wojewódzkim Ośrodku Medycyny Pracy w Białymstoku w latach 2005-2009

Streszczenie

Wstęp. Badania stanu zdrowia kierowców w Polsce są w praktyce ograniczone do badań kandydatów na kierowców i badań okresowych kierowców uczestniczących w transporcie drogowym, a w mniejszym stopniu do badań na podstawie art. 122 ust. 1 pkt 3a, 3b i 4 ustawy – Prawo o ruchu drogowym. W związku z planowanym wejściem w życie w dniu 19 stycznia 2013 r. nowej ustawy o kierujących pojazdami ta ostatnia podstawa prawna ulega istotnej zmianie.

Cel. Celem pracy było dokonanie charakterystyki ilościowej i jakościowej kierowców, którzy w latach 2005-2009 byli poddani badaniom lekarskim w Podlaskim Wojewódzkim Ośrodku Medycyny Pracy w Białymstoku z powodu: uczestniczenia w wypadkach drogowych, prowadzenia pojazdu w stanie nietrzeźwości i skierowani decyzją starosty z powodu zastrzeżeń, co do stanu zdrowia.

Material i metody. Informacje dotyczące kierowców badanych z przyczyn zdrowotnych pochodzą z badań wykonanych w Podlaskim Wojewódzkim Ośrodku Medycyny Pracy w latach 2005-2009. Wśród nich było 558 kierowców badanych po wypadkach drogowych (art. 122 ust. 1 pkt 3a), 6681 kierowców prowadzących pojazd w stanie nietrzeźwości (art. 122 ust. 1 pkt 3b) i 210 kierowców skierowanych przez starostę z powodu zastrzeżeń, co do stanu zdrowia (art. 122 ust. 1 pkt 4).

Wyniki. We wszystkich grupach badanych kierowców dominowali mężczyźni (w granicach 90%). Nieproporcjonalnie wysoki udział w grupie kierowców – uczestników wypadków drogowych i prowadzących pojazd w stanie nietrzeźwości stanowili młodzi kierowcy w wieku 20-25 lat. Negatywne orzeczenie lekarskie otrzymało 18% kierowców, którzy uczestniczyli w wypadkach drogowych i około 18% kierowców, którzy prowadzili pojazd w stanie nietrzeźwości.

Wnioski. Najczęstszą przyczyną orzeczeń negatywnych kierowców były: problemy alkoholowe, następnie zaburzenia neurologiczne, stan narządu słuchu, stan układu wzrokowego i zaburzenia psychiczne. Wskazane jest utrzymanie i rozszerzenie możliwości badań kierowców z przyczyn zdrowotnych.

Słowa kluczowe: badania lekarskie kierowców, wypadki drogowe, alkohol, młodzi kierowcy, prawo o ruchu drogowym.

Medical examinations of drivers for health reasons performed in compliance with the Road Traffic Act in the Podlaski Regional Centre of Occupational Medicine in Białystok in the years 2005-2009

Abstract

Introduction. Health examinations of drivers in Poland have been limited practically to examining candidates for drivers, to periodic testing of drivers involved in road transport and, to a lesser extent, to medical examinations under Article 122.1.3a,3b,4 of the Road Traffic Act. Since a novel Act on vehicle drivers is expected to enter into force on January 19th, 2013, this latter legal basis will undergo a significant change.

Aim. The aim of the study was to provide quantitative and qualitative characteristics of drivers who had undergone medical examinations in the Podlaski Regional Centre of Occupational Medicine in Białystok in the years 2005-2009 due to being involved in road accidents, drunk driving or referred by decision of the District Foreman due to health-related reservations.

Material and methods. The data concerning drivers examined for health reasons were obtained through research conducted in the Podlaski Regional Centre of Occupational Medicine in the years 2005-2009. Among the drivers, 558 were examined after road accidents (Article 122.1.3a), 6,681 due to driving under influence of alcohol (Article 122.1.3b) and 210 were referred by decision of the District Staroste because of health status concerns (Article 122.1.4).

Results. Men were predominant in all groups of drivers (around 90%). In the group of drivers involved in road accidents nearly a half (48.9%) was composed of young drivers in the age to 30 years and the older drivers aged above 55 years accounted for only 7.3%. In the group of drivers driving under influence of alcohol young drivers participated also in high proportion – 32.2%. There were 18% of negative medical certificates and also 18% of negative medical certificates in the group of drivers driving under influence of alcohol.

Conclusions. High percentage of young males in the group of drivers participating in road accidents and in the group of drivers driving under influence of alcohol is the significant problem of road safety in the Podlaskie Voivodeship. It is advisable to maintain and to extend the opportunities to medically examine the drivers participating in road accidents and the drivers driving under influence of alcohol.

Keywords: medical examinations of drivers, road accidents, alcohol, young drivers, road traffic law.

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INTRODUCTION

New regulations of January 6, 2011 Act on Vehicle Drivers [1] will enter into force on January 19th 2013. Essential changes have been made in the Act relating to medical examinations of drivers, which will replace the regulations of Road Traffic Act of June 20th 1997 [2]. Therefore, the implemented changes will also refer to the situations in which medical examinations should be conducted, and to the methods of gathering medical data. This paper presents information concerning the results of medical examinations of drivers collected on the basis of the existing regulations, in particular Article 122.1.3a,3b,4 of the Road Traffic Act [2].

The health status of drivers in Poland has been tested mainly through the medical examinations of candidates for driving license. Periodic medical examinations are also carried out for road transport drivers. Other medical examinations are made, although much less frequently, on the basis of Article 122.1, especially items 3a, 3b and 4 of this Act. Drivers involved in road accidents (3a), driving under influence of alcohol (3b) and due to health concerns (point 4) have to be examined.

Results of the studies of the health status of these groups of drivers have not been published in Polish medical literature. The data may be useful for assessing the quantity and quality of the health status of drivers, and therefore for evaluating their impact on road safety in Poland.

However, medical examinations of drivers, referred to in Article 122.1.3a,3b,4 of the Road Traffic Act have been limited by ambiguous wording of these regulations, according to which only some of the drivers with road safety threatening health problems have to undergo medical examinations.

According to Article 122.1.3a, a driver is referred to medical examination by a traffic control authority if "involved in a road accident in consequence of which there was death or serious injury of another person." This regulation states that the requirement for the driver's medical examination is death of another person (other than the driver's) or serious injury of another person or the driver. In this situation, it is not possible to refer the driver for a medical examination, if the accident victim suffers bodily injury other than serious. Traffic control authority – primarily the police have to decide whether health damage is serious or slight, as only in the first case the police are authorized to issue a referral to a medical examination.

Article 122.1.3a has been formulated as an obligation of a driver to undergo medical examination on receiving a referral from a traffic control authority. There is, however, no obligation of the authority to issue such a referral, which may be understood that the issuing of such referrals depends on the recognition of the responsible organ to do so.

As the driver's health may be one of the causal factors of road accidents, medical examination of a driver involved in a road accident seems indispensable and should be performed regardless of whether the consequence of the accident is a serious or light bodily harm to the driver or other road users. Pursuant to current regulations, the driver involved in a road accident, in which the driver, the passenger or the pedestrian have sustained serious injury, is subjected to medical examination, whereas the driver who has suffered a slight injury, if there are no other victims, or the victims suffer only

slight injury, does not have to undergo medical examination. Determination whether the driver's health could have caused the crash or whether health effects of this crash preclude further driving should be an essential objective of the examination.

Article 122.1.3b refers to the situation when the driver has not caused an accident, but has been found to drive under the influence of alcohol or other substances having a similar effect. Such a driver is referred for medical examination to confirm or exclude addiction to alcohol or other psychotropic substances, which, according to Article 91 of the Road Traffic Act precludes the use of driving license. The Act specifies that the driver who is in a state of intoxication (blood alcohol level above 0.5‰) can undergo medical examination, but not when driving after alcohol use (i.e. when alcohol level is within the limits of 0.2-0.5‰).

A threshold level has not been specified for the substances having a similar effect as alcohol; therefore their very presence in the driver's blood is the basis for issuing the referral for medical examination. The referral is also issued by the traffic control authority.

The list of substances with an alcohol-like effect that entitle to issue a referral for medical examination was established by the Regulation of the Minister of Health of June 11th 2003 concerning the list of substances with an alcohol-like effect and conditions and methods of testing for their presence in the body [3].

Article 122.1.4 of the Road Traffic Act has authorized the District Staroste to issue by administrative decision a referral for medical examination in cases of concern for driver's health status. This is the only opportunity to examine the so called amateur drivers, who are not professionally involved in road transport. The District Staroste has been imposed with the obligation to ensure that those who are not entitled to drive vehicles and not subject to compulsory medical examination for other reasons have the required health status not only when applying for driving license, but also later, when using it.

When issuing the referral for medical examination, the District Staroste should suspect the existence of health-related contraindications to further participate in road traffic. The suspicion may be based on the information from various sources (e.g. the Police) concerning poor health status of the driver or symptoms suggesting inability to drive a vehicle (e.g. poor eyesight, mental disorder). Decisions on issuing referrals for a medical examination are made by the District Staroste basing on his own discretion, which, due to the fact that various District Starostes may have different criteria, may result in discrepancies in the frequency of issuing them.

As it can be assumed that medical examinations carried out under Article 122.1.3a,3b,4 of the Road Traffic Act, and that medical certification based on their findings refer to the cases that require in-depth analysis and particular care, only specialized centers, i.e. the regional centers of occupational medicine, are entitled to perform these examinations and issue medical certificates (Section 9, paragraph 1 of Ordinance of the Minister of Health of January 7th 2004 on medical examinations of drivers and those applying for driving license) [4].

The above-mentioned situations concern the drivers whose health status may cause a serious threat to road traffic

safety. Quantitative and qualitative analyses of these findings are facilitated by a relatively easy access to medical documentation as data are stored in the provincial centers of occupational medicine. The results of the following analysis, illustrating the problem of the health status of drivers, may be useful for planning measures to improve road safety in Poland.

AIM

The aim of this study was to prepare a qualitative and quantitative characteristic of drivers who were subjected to medical examination in the Podlaski Regional Centre of Occupational Medicine in Białystok in the years 2005-2008 due to being involved in road accidents, driving in a state of intoxication and by decision of the District Staroste due to health status concerns.

MATERIAL AND METHODS

The study used medical records of medical examinations of drivers in the years 2005-2009, obtained from the Podlaski Regional Centre of Occupational Medicine in Białystok. The analysis referred to the number, sex and age of drivers, as well as their health status, being the cause of negative medical decision.

RESULTS

In the years 2005-2009, a total of 7,449 medical examinations were performed in situations referred to in Article 122.1.3a,3b,4 of the Road Traffic Act in the Podlaski Regional Centre of Occupational Medicine in Białystok. Their yearly distribution was as follows:

- 2005 – 1,357 examinations
- 2006 – 1,647 examinations
- 2007 – 1,147 examinations
- 2008 – 1,798 examinations
- 2009 – 1,500 examinations

Surprising are substantial differences in the number of medical examinations, ranging from 1,147 to 1,798 in the years 2005-2009, despite unchanged legal standards. There were 96.3% men and 3.7% women in the study group.

Drivers examined under Article 122.1.3a

In the years 2005-2009, a total of 558 medical examinations of drivers involved in road accidents were performed in the Podlaski Regional Centre of Occupational Medicine in Białystok, including 87.42% of men and 12.6% of women. The number of medical examinations of drivers, performed in the years 2005-2009 compared to the number of road accidents that occurred in the Podlaskie Voivodeship (data according to Police Headquarters), are shown in Table 1.

The number of medical examinations following road accidents, performed in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine in Białystok, decreased over 3-fold, from 165 in 2005 to 52 in 2009, with a slight reduction in the number of road accidents from 1,185 in 2005 to 1,040 in 2009. As a result, the percentage of drivers who underwent medical examination was reduced from 14% in 2005 to 5.2% in 2009.

The distribution of age groups of drivers involved in road accidents examined in the Podlaski Regional Centre of Occupational Medicine in 2005-2009 is presented in Table 2 and Figure 1.

In the group of drivers involved in road accidents subjected to medical examinations young men aged 20-25 and 26-30 were predominant. The number of drivers in these two age categories constituted nearly half of all the drivers subjected to examination from all age groups.

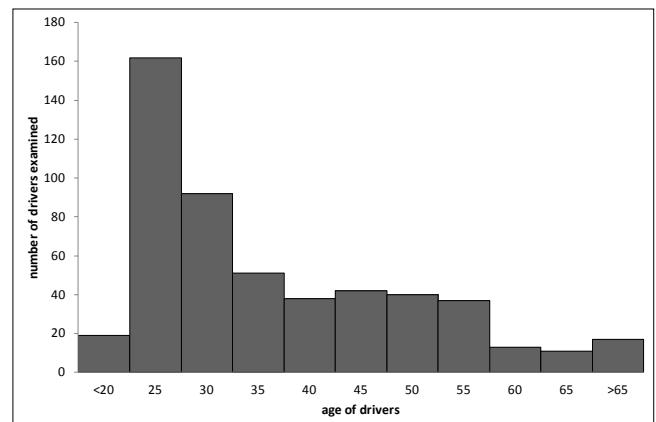


FIGURE 1. The distribution of age groups of drivers involved in road accidents examined in the Podlaski Regional Centre of Occupational Medicine in 2005-2009.

TABLE 1. The number of medical examinations of drivers involved in road accidents performed in the Podlaski Regional Center of Occupational Medicine and the number of road accidents in the Podlaski Voivodeship in 2005-2009.

Year	The number of drivers examined	The number of road accidents	Relation A to B
	A	B	A/B 100%
2005	177	1,185	14.9%
2006	148	1,149	12.9%
2007	96	1,167	8.2%
2008	83	1,129	7.4%
2009	54	1,040	5.2%
Total	558	5,670	

TABLE 2. The distribution of age groups of drivers involved in road accidents in the Podlaski Voivodeship in 2005-2009, subjected to medical examinations in the Podlaski Regional Centre of Occupational Health.

Age of drivers (in years)	The number of drivers					Total
	Year					
	2005	2006	2007	2008	2009	
<20	5	6	2	1	5	19
20-25	61	44	28	26	13	162
26-30	26	27	10	19	10	92
31-35	20	10	8	8	5	51
36-40	11	12	7	3	5	38
41-45	10	12	7	9	6	42
46-50	12	13	5	8	2	40
51-55	9	5	13	6	4	37
56-60	5	2	4	2	0	13
61-65	2	5	3	1	0	11
>65	9	4	1	1	2	17

In all the years of the study period, i.e. 2005-2009, drivers aged 20-25 were in majority, whereas those over 55 accounted only for 7% of all the drivers examined.

Table 3 shows the distribution of medical certificates, issued after medical examinations of drivers involved in road accidents in the years 2005-2009 (positive opinion means lack of medical contraindications to drive, negative opinion is due to medical contraindications to drive). In the years 2005-2009 the number of positive medical opinions was 3 to 6-fold greater than the number of negative ones.

Throughout the period from 2005 to 2009, a total of 456 (88.7%) positive opinions and 102 (18.3%) negative opinions were issued.

TABLE 3. The distribution of positive and negative medical certificates after examining all the drivers involved in road accidents in the Podlaski Voivodeship in 2005-2009 issued in the Podlaski Regional Centre of Occupational Medicine.

Type of medical certificate	Year					Total
	2005	2006	2007	2008	2009	
Positive	146	115	75	72	48	456
Negative	31	33	21	11	6	102

Negative medical decisions were associated with various types of health problems. In the years 2005-2009, in the Podlaski Regional Centre of Occupational Medicine, the following groups of health problems precluding driving were diagnosed in drivers following road accidents:

- neurological disorders 56 opinions
- eyesight defects 14 opinions
- hearing defects 14 opinions
- mental disorders 14 opinions
- alcoholism 9 opinions
- locomotor disability 9 opinions
- cardiovascular diseases 8 opinions
- diabetes 5 opinions
- epilepsy 2 opinions
- Total 131 opinions

The sum of all causes is greater than the total number of negative medical certificates (102), as in some cases more than one cause for negative opinion was found.

Drivers examined under Article 122.1.3b

In the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine, a total of 6,681 drivers underwent medical examinations due to drunk driving, including 97.7% of men and 2.3% of women.

Table 4 presents the number of medical examinations of these drivers, performed in the years 2005-2009, compared with the number of drunk drivers detained in those years by the police in the Podlaskie Voivodeship (data from Main Police Headquarters).

In the years 2005-2009, the number of medical examinations in this group of drivers showed great fluctuations, yet, without a falling tendency, ranging from 979 in 2009 to 1,670 in 2008. Participation in medical examinations of this group of drivers accounted for about 15-35% of the entire group of drivers driving in a state of intoxication and detained by the police in Podlaskie Province.

Table 5 and Fig. 2 show the distribution of age groups within this group of drivers, examined in the Podlaski Regional Centre of Occupational Medicine in 2005-2009.

Among the drivers driving in a state of intoxication, the group of 20-25 year-olds was the largest, just like in the case of "after accident" drivers. However, its size was less than two times higher compared to the subsequent age groups up to 50 years. The share of age group of drivers over 50 was less than 7%. Shares of the 5-year age groups within the range from 20 to 50 were almost identical.

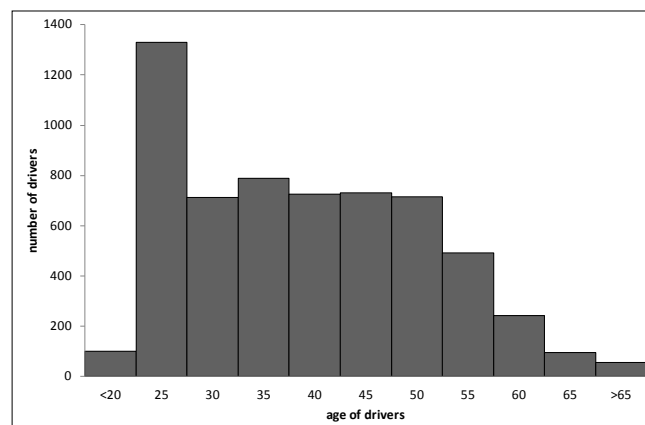


FIGURE 2. The distribution of age groups of drivers examined in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine due to driving in a state of intoxication.

TABLE 4. The number of medical examinations of drivers detained due to driving under the influence of alcohol in the years 2005-2009, performed in the Podlaski Regional Centre of Occupational Medicine.

Year of examination	Number of drivers examined	Number of drunk drivers	Relation A to B
	A	B	A/B 100%
2005	1,161	7,959	14.6
2006	1,457	5,959	24.5
2007	979	5,030	19.5
2008	1,670	4,758	35.1
2009	1,414	4,765	29.7
Total	6,651	28,471	23.4

TABLE 5. The distribution of age groups of drivers examined in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine in 2005-2009 due to drunk driving.

Age group	The number of drivers					Total
	Year					
	2005	2006	2007	2008	2009	
<20	28	18	8	20	27	101
20-25	251	329	192	326	232	1,330
26-30	148	241	130	193	210	712
31-35	145	173	111	205	156	79
36-40	150	166	106	171	134	727
41-45	142	163	119	155	152	731
46-50	140	139	113	160	163	715
51-55	82	89	62	149	109	491
56-60	44	41	33	68	56	242
61-65	15	18	12	31	21	97
>65	7	9	10	11	19	56

Table 6 shows the distribution of medical certificates following the examinations of drivers driving in a state of intoxication in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine. In all the years, the number of medical positive opinions was 4- to 5-fold higher than the number of the negative ones. In the years 2005-2009, 5,476 (86.0%) positive medical certificates and 5,476 (82.0%) negative opinions were issued.

The predominant reason for negative medical opinion in this group of drivers, as expected was alcoholism. Negative decision due to alcohol abuse was issued in the case of 512 drivers, constituting 42.5% of all negative decisions. Apart from alcoholism, the causes also included (as an additional or the only cause):

- neurological disorders 351 opinions
- hearing defects 160 opinions
- eyesight defects 123 opinions
- cardiovascular diseases 109 opinions
- mental disorders 108 opinions
- locomotor disability 54 opinions
- diabetes 25 opinions
- epilepsy 10 opinions

Drivers examined under Article 122.1.4

In the years 2005-2009, a total of 210 drivers, including 93.2% men and 6.8% women, were subjected to medical examination, being referred by the District Staroste due to health status concerns.

Table 7 presents the number of medical examinations of drivers referred for medical examinations by the District Staroste due to health concerns. The number of medical examinations of the drivers referred by the District Staroste ranged from 19 to 72 per year, and showed an increasing tendency

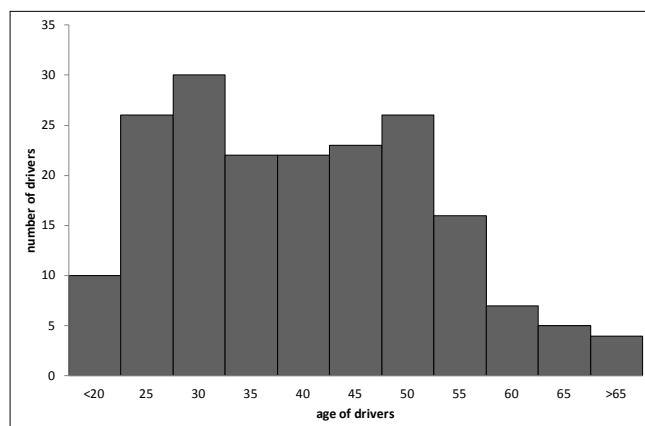


FIGURE 3. The distribution of age groups of drivers referred by decision of the District Staroste in the years 2005-2009 for medical examinations in the Podlaski Regional Centre of Occupational Medicine.

TABLE 6. The distribution of positive and negative medical opinions following the examinations of drivers driving in a state of intoxication in the years 2005-2009 in the Podlaski Voivodship, issued in the Podlaski Regional Centre of Occupational Medicine.

Type of medical opinion	Year					Total
	2005	2006	2007	2008	2009	
Positive	942	1134	809	1404	1187	5476
Negative	219	323	170	266	227	1205

in the years 2005-2007 and a falling tendency in the years 2007-2009.

Table 8 and Fig. 3 show age distribution in this group of drivers examined in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine. Due to a small number of drivers examined annually the total age distribution is presented for the entire period of 2005-2009.

The distribution of age groups of drivers referred for examination by decision of the District Staroste due to health concerns was regular within the range of 20 to 50 years (20-30 drivers). Over the age of 55 the number dropped to 4 drivers in the age group over 65 years, in the entire period of 2005-2009.

In the years 2005-2009, 129 (58.6%) positive medical certificates and 81 (41.4%) negative opinions were issued in this group of drivers. (Figure 3)

The reasons for negative medical opinions in this group of drivers (an additional or the only cause) were as follows:

- mental disorders 30 opinions
- neurological disorders 27 opinions
- alcoholism 18 opinions
- diabetes 9 opinions
- locomotor disability 8 opinions
- epilepsy 7 opinions
- hearing defects 6 opinions
- cardiovascular diseases 5 opinions
- eyesight defects 5 opinions

TABLE 7. The number of medical examinations of drivers referred by decision of the District Staroste in the years 2005-2009, performed in the Podlaski Regional Centre of Occupational Medicine.

Year	The number of medical examinations of drivers
2005	19
2006	42
2007	72
2008	45
2009	32
Total	210

TABLE 8. The distribution of age groups of drivers examined in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine, referred for examination by decision of the District Staroste due to health concerns.

Age group (years)	Number of drivers
<20	10
20-25	26
26-30	30
31-35	22
36-40	22
41-45	23
46-50	26
51-55	16
56-60	7
61-65	5
>65	4

DISCUSSION

Results of health status examinations of road traffic participants in Poland are essential for road safety and public health protection. The possibility to obtain information on the health status of drivers is related primarily to the so called "professional" road transport drivers who are obliged to undergo periodic medical examinations. However, such examinations are not compulsory for the vast majority of drivers in Poland (about 10 million), apart from driving license candidates.

Situations which admit of driver's medical examination are described in Article 122.1.3a,3b and 4 of the Road Traffic Act. They include drivers' involvement in a road accident, driving under the influence of alcohol or other substances having a similar effect, and referral by the District Staroste decision due to health-related reservations. Until December 31st 2003 these examinations had been performed by the regional centres of occupational medicine and by research institutions in this field. From January 7th 2004, in accordance with §9.1 of the regulation [4], these examinations have been conducted by regional centres of occupational medicine and can be done by research institutions only when under appeal. No works on the research concerning these groups of drivers have been published yet.

The current study contains an analysis of medical examinations of the three groups of drivers mentioned above, conducted in the years 2005-2009 in the Podlaski Regional Centre of Occupational Medicine in Białystok, that functions in the region inhabited by approximately 1.19 million of the population. In the Podlaskie Voivodeship, about 0.5 million motor vehicles were registered then, including approximately 400,000 cars.

In 2005-2009, in Podlaskie Voivodeship there were on average 1,100 road accidents per year (range 1,040-1,185), with a slight falling tendency over the period. This means that a least 1,100 drivers annually were involved in road accidents. Of this number, only those who participated in serious and fatal accidents were subjected to medical examination.

The number of fatal accidents in the Podlaskie Voivodeship is shown by the Police statistics on road accidents. Throughout the study period there were about 200 accidents per year, whereas the number of serious road accidents is unknown. The mean number of serious road accidents in the years 2005-2009 in Podlaskie Voivodeship may be estimated at an average of 300 per year [5].

It can be thus assumed that each year drivers involved in approximately 500 road accidents should be referred by the Police for medical examination. In fact, a lot fewer drivers were referred, the number decreasing more than 3-fold from 177 drivers in 2005 to 54 drivers in 2009. While in 2005 almost every third driver involved in a serious road accident was referred for medical examination, in 2009 – only every tenth. This means deterioration of the representativeness of the results of health status examinations of drivers involved in road accidents.

Among the drivers involved in road accidents there were 87.4% men and 12.6% women. Current data on the involvement of female drivers in road traffic are unknown. Accord-

ing to the estimated data from Warsaw from 1995, the share of female drivers in road traffic was approximately 20% [6]. It can be assumed that the involvement of female drivers in road traffic increased in the years 2005-2009. Taking 25% participation as a rather underestimated calculation it can be stipulated that the involvement of female drivers in road accidents was at least 2-fold lower than their participation in the traffic (12.6/25, i.e. about 1/2). However, it is necessary to assume that women drivers were referred by the police for medical examinations in a similar proportion to their involvement in road accidents as were men drivers.

The distribution of age of the drivers involved in road accidents in Podlaskie Voivodeship showed a huge asymmetry. Two age groups were predominant: the largest was the 20-25 age group, followed by almost half that large the 25-30 age group. Young drivers aged below 31 years together accounted for 48.9% of all the drivers examined. The high share of this group among the drivers involved in road accidents was confirmed by the Police data and many national and international reports [5-13]. The share was particularly high in Podlaskie Voivodeship, where almost every second driver involved in a road accident in the years 2005-2009 was at the age below 30 years. In the study from 1990s concerning drivers from Warsaw and its adjacent districts, the share of drivers in the age group up to 29 years was about 35% [6].

The share of drivers in the following age groups: 31-35, 36-40, 41-45, 46-50 and 51-55 in road accidents was similar and amounted to 7-9%. The involvement in road accidents of drivers in the age groups 56-60, 61-65 and over 65 years was much smaller and accounted for 2-3%. These data are similar to those shown in one of the earliest studies [6].

A similar distribution of age groups each year within the study period (2005-2009) suggests an accurate representativeness of the involvement of the respective groups of drivers in road accidents. In all these years, the share of the 20-25 and 26-30 age groups was the largest. The study findings confirm that young age of the driver (under 31) and being male are risk factors for road accidents. Older drivers (over 55 years old) did not pose a significant threat to accident statistics.

Medical examinations of drivers involved in road accidents in Podlaskie Voivodeship and referred by the Police, in almost 80% of cases yielded positive certificates, i.e. no significant health problems were found. A negative decision was issued in every 5th-6th case, which meant that health problems were detected. Each year over the period of 2005-2009 the percentage of negative opinions was similar. These results indicate high prevalence of health problems in drivers involved in road accidents, which justifies the need to perform medical examinations in this group.

Types of health problems that did not qualify the driver for positive medical certification included: neurological disorders, visual and hearing defects, and mental disorders. Neurological disorders constituted a significantly high share in the reasons for negative medical decision, which can be associated with injuries sustained in accident (especially head injuries) and may be attributed to thorough examination of the nervous system which road crash participants underwent in the Podlaski Regional Centre of Occupational Medicine. Each driver was examined by a neurologist and

EEG was performed when indicated. Interesting is a small proportion of such common disorders as cardiovascular disease, diabetes and epilepsy among the reasons for obtaining a negative medical opinion.

The mean number of drivers referred for medical examination due to drinking and driving in the respective years of the study period amounted to 1,136 per year and ranged from 979 to 1,670. In relation to the general number of drunk drivers detained by the police in Podlaskie Province in the years 2005-2009, those referred for medical examination accounted for 25% on average. No falling tendency was noted in the number of referrals for medical examinations, unlike the "road accident" group.

Men predominated in the group of drunk drivers, accounting for almost 98% of all the drivers referred for medical examination. Only every 45th driver was a woman. Among the age groups of drunk drivers, like in the case of drivers – participants of road accidents, the group of young drivers aged 20-25 was the most numerous and accounted for 18% of all the drunk drivers examined. The share of drivers from age groups 26-30, 31-35, 36-40, 41-45, 46-50 was similar and amounted to approximately 10%. Also in this case, the groups of oldest drivers aged 61-65 were least numerous. Similar data can be found in literature [6,14]. In a study conducted in Opole Province in 2000-2005, the largest number of victims of road accidents caused by drunk drivers occurred in the age group of 25-39 years, although this figure included drivers, passengers and pedestrians [15].

Just like in the case of drivers involved in road accidents, nearly 80% of medical decisions issued to drivers referred due to drunk driving do not stipulate medical contraindications to drive. Negative opinions were issued to 18% of drivers per year, which means an average of about 200. The predominant cause of the negative opinions was, as might be expected, alcoholic problems, accounting for 42.5% of all negative decisions. In addition, frequent reasons for negative medical opinion were neurological disorders, hearing and visual defects, cardiovascular diseases and mental disorders.

The drivers examined by the District Foreman decision due to health-related reservations constituted the smallest group. Over the period of 2005-2009, 220 drivers were examined, including women who accounted for merely 6.8% of this group. The number of annual medical examinations in the years 2005-2009 varied immensely, ranging from 19 to 72. The distributions of 5-year age groups from 20 to 50 were similar. The number of older drivers was not increased. As could have been expected, this group of drivers had the highest percentage of negative medical opinions (41%), as the examinations were performed due to health concerns. The most common causes of negative medical opinions in this group were mental and neurological disorders and alcoholism.

Taking into account the markedly smaller size of the group of drivers examined due to health concerns as compared to the group of drivers involved in road accidents, it should be stated that health status determination in the former group is not taken advantage of. It is thus not critical for the assessment of drivers' health and has no significant impact on road safety improvement in Poland.

The medical examinations of drivers performed in the Podlaski Regional Centre of Occupational Medicine in the years 2005-2009 under the provision of Article 122.1.3a,3b,4 of the Road Traffic Act, every year, on average, revealed important health problems in 241 drivers referred due to driving under the influence of alcohol, in 20 involved in road accidents and in 16 referred by the District Staroste due to health status concerns.

CONCLUSIONS

1. Among the drivers examined in the Podlaski Regional Centre of Occupational Medicine in the years 2005-2009 under the provision of Article 122.1.3a,3b,4 of the Road Traffic Act, men (about 90%) and young drivers aged 20-25 had a disproportionately large share in the group of drivers involved in road accidents and those examined due to driving in a state of intoxication.
2. Relatively low share of older drivers (aged above 55 years) in the total group of examined drivers (7%) has been found.
3. Medical contraindications to driving were found in about 18% drivers involved in road accidents and in 18% examined due to driving under the influence of alcohol.
4. The most common medical contraindications were: alcoholic problems, neurological disorders, hearing and visual defects, and psychical disorders, with a relatively low incidence of diabetes and epilepsy.
5. It is advisable to maintain and extend the possibility of medical examinations of drivers, especially those involved in road accidents and referred to medical examination due to driving in a state of intoxication.

REFERENCES

1. Ustawa z dnia 5 stycznia 2011 r. o kierujących pojazdami (Dz. U. Nr 30, poz. 151 z póź. zm.).
2. Ustawa z dnia 20 czerwca 1997 r. – Prawo o ruchu drogowym (Dz. U. z 2005 r. Nr 108, poz. 908 z póź. zm.).
3. Rozporządzenie Ministra Zdrowia z dnia 11 czerwca 2003 r. w sprawie wykazu środków działających podobnie do alkoholu oraz warunków i sposobu przeprowadzania badań na ich obecność w organizmie (Dz. U. Nr 116, poz. 1104.).
4. Rozporządzenie Ministra Zdrowia z dnia 7 stycznia 2004 r. w sprawie badań lekarskich kierowców i osób ubiegających się o uprawnienia do kierowania pojazdami (Dz. U. Nr 2, poz. 15 z póź. zm.).
5. Pawińska M, Piątkiewicz JA, Zalewska M, Jamiołkowski J, Szpak A, Matwiejuk B, Czerwiński A. Ofiary wypadków drogowych w województwie podlaskim w latach 2000-2006. Zdr Publ. 2008;118(4):426-31.
6. Piątkiewicz JA. Analiza przyczyn wypadkowości drogowej w województwach stołecznym i ciechanowskim w latach 1993-1995. Zdr Publ. 2000;110(7-8):248.
7. Raport o stanie bezpieczeństwa w ruchu drogowym w Polsce 2005. Biuro Prewencji i Ruchu Drogowego Komendy Głównej Policji. 2006.
8. Raport o stanie bezpieczeństwa w ruchu drogowym w Polsce 2006. Biuro Prewencji i Ruchu Drogowego Komendy Głównej Policji. 2007.
9. Wypadki drogowe w Polsce w 2008 roku; Komenda Główna Policji. Biuro Ruchu Drogowego. 2009.
10. Correlli E. Crash data and rates for age-sex groups of drivers, 1996. National Center for Statistics and Analysis, Washington, DC, 1998.
11. Evans L. Traffic Safety and the Driver. Van Nostrand Reinhold, New York 1991.
12. Williams AF. Teenage drivers: patterns of risk. J Safety Res. 2003;34:5-15.

13. World report on road traffic injury prevention. WHO Geneva 2004.
14. Young drivers impaired by alcohol and other drugs.(ed.) T. Benjamin. Royal Society of Medicine. London, New York; 1987.
15. Hasij J, Barziej J, Michałek O, Broczkowski R, Bucior J, Stępniaak J. Analiza wypadków drogowych spowodowanych nietrzeźwością kierujących w województwie opolskim w latach 2000-2005. Zdr Publ. 2008;118(2):171-5.

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