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Od wystąpienia zdarzenia do procedur leczenia ratunkowego – złota godzina na przykładzie pogotowia ratunkowego w Słupsku

From the accident to emergency treatment procedures – the golden hour based on example of an Emergency Ambulance Service in Słupsk

Streszczenie

Cel pracy. Określenie czasu od chwili wystąpienia zdarzenia (zagrożenia zdrowia lub życia) do chwili podjęcia specjalistycznego leczenia w myśl zasady „złotej godziny”. Zbadanie czynników mających wpływ na czas rozpoczęcia leczenia ratunkowego poszkodowanych w izbie przyjęć słupskiego szpitala.

Materiały i metody. Do badań użyte zostały karty wyjazdowe Stacji Pogotowia Ratunkowego w Słupsku. Narzędziem pomiaru były przeliczenia własne czasów dojazdu do pacjenta, transport do najbliższego szpitala i transport między izbami przyjęć szpitala oraz czas rozpoczęcia specjalistycznego leczenia w szpitalu.

Wyniki. Czas dotarcia do poszkodowanego w 2006 roku, w mieście: mediana – 6 min, trzeci kwartyl – 9 min; poza miastem: mediana – 20 min, trzeci kwartyl – 25 min. Zabezpieczenie, transport, dotarcie z poszkodowanym do szpitala z aglomeracji miejskiej w czasie ok. 29 min, spoza rejonu miasta – ok. 52 min. Oczekiwanie w izbie przyjęć na lekarza – ok. 13 min. Transport, „wędrówka” pacjenta między oddziałami szpitala – średnio 13-20 min. Ostateczne rozpoczęcie leczenia ratunkowego pacjenta z miasta następuje w czasie ok. 55-62 min, spoza miasta – w czasie ok. 78-85 min.

Wnioski. Krótki czas dotarcia ambulansu do pacjenta w aglomeracji miejskiej i poza miastem. Obecnie na opóźnianie właściwego leczenia w słupskim szpitalu ma wpływ wiele czynników: brak SOR, brak lekarza izby przyjęć, brak jednego obiektu szpitala, odległość i transport pacjentów między izbami przyjęć szpitala.

Słowa kluczowe: poszkodowany, złota godzina, szpitalny oddział ratunkowy.

Summary

The aim. Describing the time since the emergency situation occurred to the commencement of advanced medical procedures in Emergency Department according to “golden hour” idea. Analysing of factors influencing the time of starting emergency treatment in Słupsk County Hospital.

Materials and methods. Analysis of medical documentation of Słupsk Ambulance Service; especially time intervals between transporting patients to another part of the nearest hospital, next hospitals and the commencement of emergency treatment.

Results. Time of accessing patients in 2006 in agglomerations: medium 6 min., third quarter 9 min., outside agglomerations: medium 20 min., third quarter 25 min. Medical procedures in emergency place, medical transport to the hospital in agglomerations – about 29 min, outside agglomerations – 52 min. Waiting for a physician in hospital without Emergency Department about 13 min. Transport between division inside the hospital: medium 13-20 min. Starting of emergency treatment of patient transported in town 55-62 min. out of town: 78-85 min.

Conclusions. The shortest time of ambulance delivery to patients was reported in agglomerations and outside agglomerations. Currently the delay in emergency treatment in Słupsk hospital is the effect of: not established Emergency Department, deficit of emergency physicians “on call” or “on duty”, hospital premises in several buildings and some patients need to be transported from one emergency room to another in the same hospital.

Key words: accident victim, golden hour, Emergency Department.

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INTRODUCTION

In the emergency medicine the fundamental attention is directed to the organizational issues, an easy, immediately accessible emergency system based on the idea of the so-called ‘chain of survival’. For the patient, whose health or life are in danger, the chain links that are appropriately joined should provide a fast access to qualified emergency doctors, or should make it possible for the patient to reach the closest Hospital Emergency Department (SOR), or other hospital, and start medical treatment procedures there [1].

THE OBJECTIVE

Investigation of the factors that influence the time that is needed to start medical emergency treatment of a patient/victim in hospital. Defining the time from application for the hospital emergency service to the therapy commencement.

MATERIALS AND METHODS

Based on the medical documentation (departure order cards, distress call registration books) of the Emergency Ambulance Service in Słupsk (SPR), the time needed for the emergency team to reach the incident destination and to transport the victim to the hospital, was analyzed. That was the time needed to transport the patient between Słupsk hospital objects (from one emergency room to another). Basing on self-observations during the resuscitation team departures, the awaiting time for the emergency room doctor to appear in emergency room, was registered (no emergency room doctor on duty). The study was carried out from 1 January to 31 December 2006 and it covered departures divided with relation to the place of distress calls: 1) city, 2) outside the city.

A part of the test material was taken from K. Ziółkowska’s master work [2].

Table 1 shows the distribution of emergency SPR units (ambulances) in Słupsk in the city and the county in 2006,

TABLE 1. Operational region for the Emergency Unit in Słupsk [3].

Year 2006			
Teams in Słupsk	Place of awaiting	Operative region	Response time
R	Słupsk	County of Słupsk, apart from Ustka and Smołdzino communes	Up to 20 minutes
	Słupsk	County of Słupsk, apart from Ustka and Smołdzino communes	Up to 20 minutes
	Ustka	Communes: Ustka, Smołdzino	Up to 20 minutes
	Słupsk	Communes: Słupsk, Damnica, Kobylnica, Dębica	Up to 20 minutes
W	Potęgowo	Communes: Potęgowo, Damnica, Dębica	Up to 20 minutes
	Kępice	Communes: Kępice, Kobylnica	Up to 20 minutes

based on the medical emergency actions security plan. The type of the emergency team was taken into account in the plan, so was the place of attending and the operational region of each team.

In 2006, the Emergency Ambulance Service in Słupsk had six departure emergency teams (ambulances). Three teams attending in Słupsk station – one accidental ‘W’ and two resuscitation teams ‘R’, one ‘R’ team attending in Ustka co-station, one ‘W’ team attending in co-station Potęgowo and one ‘W’ team attending in co-station Kępice.

The Provincial Specialist Hospital in Słupsk is functioning in three objects with three main emergency wards; it is not provided with SOR. The localization of two hospital objects in Słupsk – distance of app. 2 km, third in Ustka, app. 20 km from Słupsk.

From the co-station Potęgowo region, some of the patients are taken to SOR in Lębork, and some other to emergency ward in Słupsk (ul. Kopernika or ul. Obrońców Wyrzeża). From the co-station Kępice, the patients are taken to SOR in Miastko, or to hospital in Słupsk. Women with gynecological problems, or those who are about to give birth, are taken to Ustka hospital by emergency teams.

RESULTS

In the Emergency Ambulance Service in Słupsk, from 1 January to 31 December, from the total number of 15 577 departures, 14 824 are those departures that had the response time taken into account in the departure order cards, including 9 844 city departures and 4 987 departures outside the city.

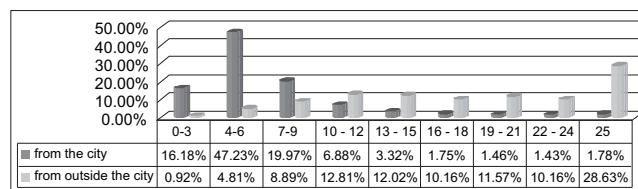


FIGURE 1. Time needed by the emergency ambulance service in Słupsk to reach the incident destination [4].

Source: SPR departure order cards in Słupsk

Basing on the results given, one can deduce that in average it took a team 6.89 minutes to reach the patient in the city, the median wasn’t more than 6.17 minutes, and the third quartile of the response time was 8.58, the modal was 5±1 minutes. From the total of 9844 departures, reaching the destination was in varied time. In 4649 cases the time was stated to be 5±1 minutes, in 1966 the drive time was 8±1 minutes, in 1593 cases the time of driving did not exceed 2±1 minutes, in 677 cases the drive time was 11±1 minutes, in 327 cases the time was 14±1 minutes, in 175 cases it was 25 minutes and more, in 172 cases the response time was 17±1 minutes, in 144 cases the time of reaching destination was 20±1 minutes, in 141 cases the response time was 23±1 minutes.

Outside the city the response time was shown as: average 17.87 minutes, median 19.33 minutes, third quartile 25.08 minutes, modal over 25 minutes. The diverse time of reaching destination was shown in Table 1. From the total of 4980 departures outside the city, in 1426 cases the approach of the teams to the incident took 25 minutes and more, in 638

departures it took 11±1 minutes, in 599 departures it took 14±1 minutes, in 576 departures, it took 20±1 minutes, in 506 departures it took 17±1 minutes, in 506 departures it took 23±1 minutes, in 443 departures it took 8±1 minutes, in 240 departures it took 5±1 minutes, and in 46 departures the time did not exceed 2±1 minutes.

Figure 2 shows the number of departures with the response time (measured from the moment of taking the order) taken into account in the departure order cards, where the patient was taken to the hospital. In 2006 from the total of 8 698 transports with patients with the drive time taken into account in the departure order cards, 5 255 transports from the city and 1243 transports from outside the city were isolated.

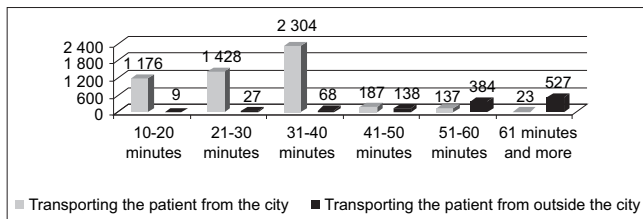


FIGURE 2. The time needed by the emergency ambulances to reach the hospital from city and from outside the city.
Source: SPR departure cards in Słupsk

Assessing data shown on the chart, the average drive time of transporting a patient from the city to hospital was 28.82 minutes, the modal was 35±5 minutes. From the city the biggest number of patients (43.8%) got to the hospital in 35.5±4.5 minutes, (27.2%) were transported in 25.5±4.5 minutes, (22.4%) were transported in 15.5±4.5 minutes, (3.6%) were transported in 45.5±4.5 minutes, (2.6%) were transported in 55.5±5 minutes, (0.4%) were transported in 61 minutes and more. From outside the city the average drive time (approach to the patient and their transport) to the hospital was 52.11 minutes, most often the team needed over 60 minutes to transport the patient. The biggest number of patients (42.4%) were transported to the hospital in 61 minutes and more, (30.9%) were transported in 55.5±4.5 minutes, (11.1%) were transported in 45.5±4.5 minutes, (5.5%) were transported in 35.5±4.5 minutes, (2.2%) were transported in 25.5±4.5 minutes, (0.7%) were transported in 15.5±4.5 minutes.

From the total of 480 departures (own) in the resuscitation team the time needed by the doctor from the ward to come to the emergency room to examine the patient and decide whether hospitalization is needed, was noted. A group of 368 patients were brought from the city, and 112 patients were brought from outside the city.

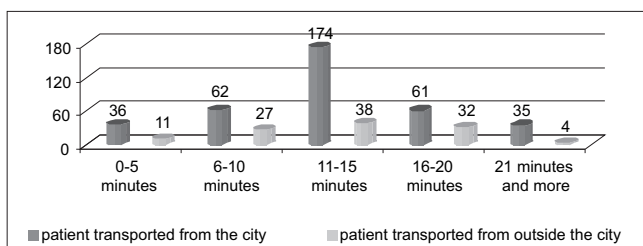


FIGURE 3. The time the patient brought to the emergency room by the medical emergency ambulances needs to see the doctor.
Source: own research

Judging the data shown on Figure 3, one can deduce that the average time the doctor needs to come from the ward to the emergency room, called to examine the patient brought from the city, is 12.96 minutes, most often they arrive in 12.5±1 minutes. The patient transported from outside the city was passed to the doctor in the emergency room in average 12.60 minutes, most often it took 12.5±2.5 minutes. From the total of cases researched, most often (44.2%) the team had to wait for the doctor to come to the emergency room for 13±2 minutes, the shortest expectation took 2±2.5 minutes, the longest one (8.1%) 21 minutes and more.

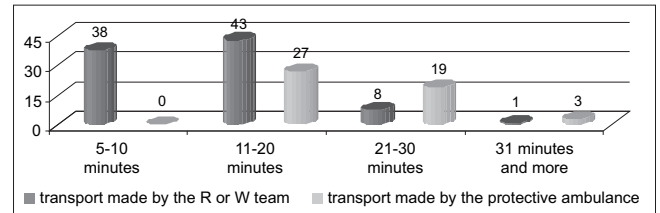


FIGURE 4. The time taken by the medical emergency team or the protective ambulance to transport the patient between emergency rooms in Słupsk's hospital.

Source: Order registration books in Słupsk's SPR

From the total of 8 598 cases directed and transported patients by the emergency team to the hospital there were 139 isolated cases, when the emergency room doctor, after examination, sent the patient for further treatment to the other ward, in the other hospital object. In 90 cases the 'R' or 'W' team (the team awaiting the doctor's decision) transported the patient, in 49 cases the patient was transported by the emergency unit's protective ambulance.

By analyzing the above results, one can deduce, that the transportation time from one emergency room to another made by the 'R' or 'W' team took: in average 12.94 minutes, most often it took 15±5 minutes. When the emergency unit protective ambulance transported the patient, it took on average 20.10 minutes. Most often the transportation took 15±5 minutes, the average time of transporting the patient 'from room to room' was 16.52 minutes.

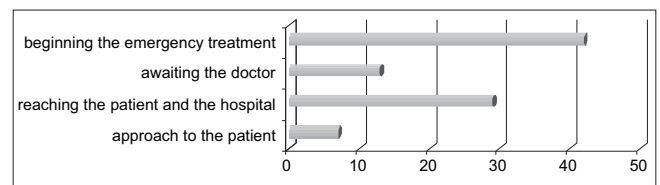


FIGURE 5. The time needed to start the emergency treatment for the patient transported by the medical emergency team from the city.

Source: own research

The above chart includes the time the emergency team needed to reach the patient in the city of over 10 thousands inhabitants, to secure the patient and transport the patient to the nearest hospital, and the time of waiting for the doctor in the emergency room. Forty two (42) minutes is the average time of passing the patient to the doctor from the ward and starting the emergency treatment.

Figure 6 shows that patient brought to the hospital by ambulance, examined by the doctor at the emergency room, after the decision they need treatment in a different ward, is transported to the other hospital object. The transport

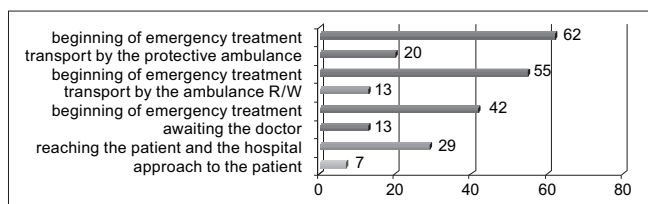


FIGURE 6. Time needed to start the emergency treatment for the patient from the city – additional transport between emergency rooms.
Source: own research

made by the ‘R’ or ‘W’ team (awaiting in the emergency room) “from one emergency room to another” prolongs the start of the emergency treatment to 55 minutes. The transport performed by the protective ambulance, awaiting at the Emergency Unit delays the start of the treatment by 62 minutes.

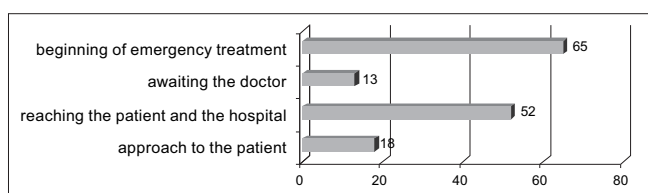


FIGURE 7. The time needed to start the emergency treatment for the patient transported by the medical emergency team from outside the city.
Source: own research

Data provided by this chart present, that the emergency team approaching patient that lives outside the city, starting the emergency treating procedures and the time it takes to transport the patient to the nearest hospital was averagely 52 minutes. The emergency treatment for the patient transported by the ambulance from outside the city was started averagely in 65 minutes.

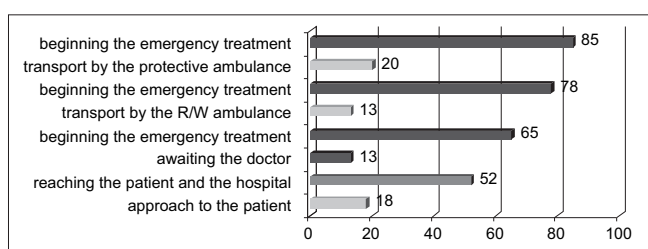


FIGURE 8. The time needed to start the emergency treatment for the patient from outside the city – additional transport between emergency rooms.
Source: own research

Judging the research results presented by Figure 8 one can make a statement that the time of beginning the emergency treatment in case of the necessity to treat the patient in another ward (the doctor decides at the emergency room) has been prolonged to 78 minutes, in case the patient is transported by the same ambulance that brought him to the hospital. The transport by the protective ambulance prolongs the emergency treatment to 85 minutes (time it takes to call the ambulance, and time it takes the ambulance to reach the hospital – the ambulance awaits at SPR). The time needed to wait for the doctor at the other emergency

room, that additionally prolongs the time of starting the treatment, has not been included in the results.

DISCUSSION

The Bill about State Medical Emergency defines proper response time parameters. The response time median in the city of over 10 thousands inhabitants should not exceed 8 minutes, outside the city 15 minutes, the third quartile in the city should not be more than 12 minutes, outside the city 20 minutes [4, 5].

The medical emergency SPR teams (Emergency Ambulance Service) in Słupsk exceed maximally the parameters of the response time outside the city.

According to the rule of the ‘golden hour’, the transport to the hospital emergency ward and the beginning of medical treatment procedures should not take more than 30 minutes from the ‘help’ signal [1]. In Słupsk Emergency ambulances in reality 30-40 minutes is the maximal time, when the patient from the city reaches the nearest hospital. From outside the city the reaching time is prolonged and often exceeds 60 minutes.

Earlier on the hospital’s emergency room, and nowadays the hospital Emergency Department) (SOR) are the most proper places for further diagnostics and preliminary treatment of those who are severely injured. It cannot be only the relay station between the ambulance and the operating theatre, x-ray workshop, ICU or any other ward [6].

The lack of Emergency Departments in the hospital in Słupsk, the wards in three different objects with three emergency rooms and no doctors on duty in those rooms, prolongs the time for the emergency treatment. The patient originally transported by the emergency unit team to the emergency room in the hospital, then according to the doctor’s decision moved to another ward in another object of the hospital results in that the final treatment of the patient, who lives in the city is started nearly in 60 minutes, for the patient from outside the city it is prolonged to 85 minutes. Nowadays the emergency rooms in the hospital are only the relay stations between the ambulance and the ward.

Emergency Departments, which are the basis for medical emergency, are completely reorganized emergency rooms, completed with observation posts and ICU posts, and equipped with diagnostic equipment, according to the standards, with operation rooms able to serve every patient brought to the ward.

It seems reasonable, that a patient with brain or spine issue, cerebral stroke, extensive burns, severe numerous, multi-organ body injuries, who needs cardiologic intervention (coronarography, removal of obliteration (PTCA), by-pass), or a very sick child, does not have to walk through many emergency wards, but land up in SOR in the hospital that has the appropriate specialist ward immediately [6].

CONCLUSIONS

1. The lack of co-stations in Smołdzino and Główny county, extensive operational region, prolongs the approach time for medical emergency ambulances. Almost half of the patients from outside the city reach the hospital in more than 60 minutes.

2. The lack of Emergency Departments, the lack of doctors on duty in emergency rooms prolongs the beginning of diagnostics and emergency treatment by almost 15 minutes.
3. The lack of one hospital object, additional transport between emergency rooms prolongs the moment of beginning the diagnostics and treatment of the patients, who live in the city to 60 minutes. The treatment of the patients from outside the city starts after 85 minutes.

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