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Analiza czynników wpływających na opóźnienie procesu leczenia u chorych z bólem w klatce piersiowej

The analysis of factors influencing the delay of the treatment by patients with the chest pain

Streszczenie

Cel pracy. Analiza i ocena przyczyn opóźnienia leczenia ostrego zespołu wieńcowego w zależności od miejsca wezwania.

Materiał i metoda. Dane do badań uzyskano z dokumentacji medycznej Stacji Pogotowia Ratunkowego w Słupsku. Dokonano analizy 822 kart wyjazdowych.

Wyniki. Stwierdzono, że najkrótszy czas dojazdu do miejsca zdarzenia w mieście i poza miastem to 4 minuty, najdłuższy w mieście – 29 minut, poza miastem – 37 minut. Najczęściej ambulans dojeżdżał w mieście w ciągu 6 minut, poza miastem 14 minut. Z terenu miejskiego najkrótszy czas, w którym pacjent trafiał do szpitala, to 18 minut, najdłuższy – 69 minut, spoza terenu miejskiego najkrótszy czas to 26 minut, najdłuższy – 78 minut. Najczęściej chorego do szpitala z miasta przywożono w czasie 28 minut, spoza terenu miejskiego w czasie 64 minut.

Wnioski. Niemal 50% pacjentów spoza terenu miejskiego oczekiwało na przyjazd ambulansu powyżej 20 minut, do szpitala przybyli po upływie 60 minut. Ponad 75% pacjentów z miasta do szpitala przywieziono w czasie 30-40 minut. Chorzy zwlekali z wezwaniem pogotowia ratunkowego niemal do 2 godzin, co powodowało opóźnienie procesu leczenia.

Słowa kluczowe: czas dotarcia do chorych, ratownictwo medyczne, ambulanse, złota godzina.

Summary

Aim of work. The analysis and evaluation of the delay in treatment of acute coronary syndrome, depending on the location of the call

Materials and methods. The data have been collected on the basis of medical documentation of Ambulance Station in Słupsk. The analysis concerned 822 cards of emergency actions.

Results. The shortest time lapse between notification and arrival of the emergency team in the town and outside the town was 4 minutes, the longest in the town was 29 minutes and the shortest – 37 minutes. In the town an ambulance most often arrived within 6 minutes, outside the town within 14 minutes. The shortest time of arrival of a patient from urban area to hospital was 18 minutes, the longest was 69 minutes. The shortest time from outside the urban area was 26 minutes and the longest 78 minutes. Patients arrived at hospital from the town most often within 28 minutes, from outside – within 64 minutes.

Conclusions. Almost half of the patients from outside urban area waited for the arrival of an ambulance over 20 minutes and appeared at hospital after 60 minutes. Over three quarters of patients from the town were driven to hospital within 30 – 40 minutes. The patients hesitated with the call to rescue ambulance service almost for 2 hours which resulted in delay of treatment.

Key words: access to the patients, emergency, ambulances service, pain in the chest, golden hour.

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INTRODUCTION

Chest pain might be caused by diseases either threatening life directly, such as myocardial infarction, unstable angina pectoris, pulmonary embolism, aortic wall dissection, esophageal rapture, or trivial ones. The symptoms might be clear, suggesting the emergency state but they may induce latent and irreversible effect as well. Cardiovascular system diseases constitute the cause of the half of all deaths in Poland.

All the patients with pain or discomfort within the chest, especially people from the risk group of coronary disease and/or undergone myocardial incidents must be suspected of the state of emergency. Acute coronary syndrome is the state of direct threat to life and it demands immediate undertaking of diagnostic and therapeutic action [1, 2].

THE AIM

The analysis and assessment of outside-hospital factors delaying the treatment process among the patients with the chest pain, sent to a cardiological ward with the suspicion of acute coronary syndrome.

THE MATERIAL AND METHODS

The accumulated reference data have been collected from the emergency ambulance service in Słupsk. The order cards carried out by emergency ambulance teams, and taken under the analysis, cover the period between 1.01 and 31.12. 2007. The reason of the emergency departures was pain in the chest with the suspicion of acute coronary syndrome, among the adults from Słupsk and communities of county of Słupsk.

During the survey all the departures were divided, according to the exact place of a visit, into: 1) visits to the patients living in the city, 2) visits to the patients living outside the city.

In the research 14 818 order cards were analysed; 822 cards concerning the chest pain with the suspicion of acute coronary syndrome were selected. There were 498 calls from the city while in 324 cases the address was outside the city.

Also the survey covers the time between:

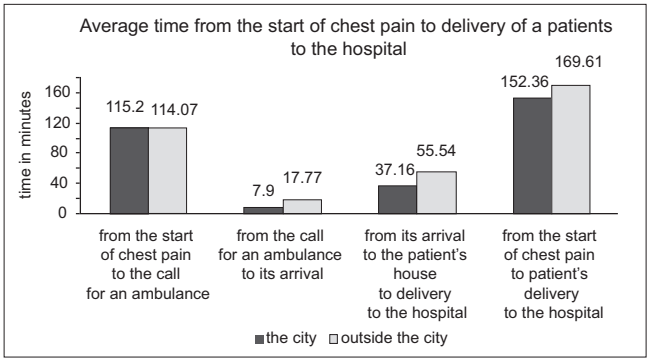
1. the start of chest pain and the call for an ambulance
2. the call for an ambulance and its arrival
3. the arrival to the patient's house and to the hospital.

The time from the start of chest pain to the call for an ambulance was obtained on the basis of the analysis of 468 order cards, including 272 order cards within the city and 196 outside it. The time from the call for an ambulance to its arrival was obtained on the basis of the analysis of 478 order cards within the city and 311 outside it. The time from the arrival to the patient's house to delivering him/her to the hospital was obtained on the basis of the analysis of 293 order cards within the city and 209 outside it. The time from the start of chest pain to the first contact between the patient and the rescuer is then called the lag time.

The time was measured in minutes. The results were presented on average, by median, moda and in time intervals. Getting to the patient was outlined in five time intervals: 1–8 minutes, 9–12 minutes, 13–15 minutes, 16–20 minutes and 21 minutes or more. The delivery of the patient to the hospital was also presented in five intervals: 30 minutes or less, 31–40 minutes, 51–60 minutes, 61 minutes or more.

RESULTS

People living in the city decided to call an ambulance a bit later than people from outside the city. The difference in making a call for an ambulance was not of a great importance, about 1.13 minutes. The average time taken from the start of chest pain to the call for an ambulance was 114.64 minutes in both groups of patients.



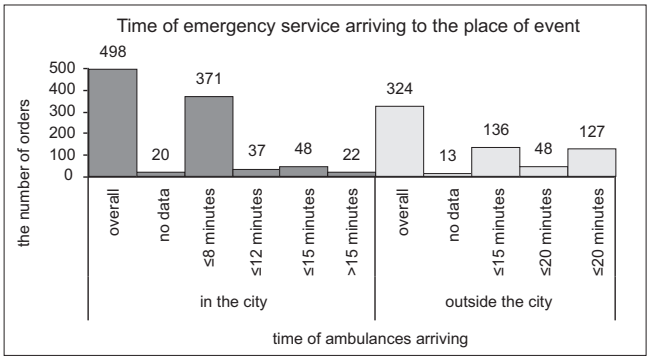
Source: order cards form emergency ambulance service in Słupsk

FIGURE 1. The comparison of time from the beginning of chest pain, of time taken to arrive to the patient's house and of the delivery to the hospital depending on the place of a call (in minutes).

Time taken from the call to arrival of an ambulance was different in the city than the one in the country. The average time from the beginning of chest pain to the arrival of a qualified medical rescue team inside the city amounted to 123.1 minutes. In the cases outside it, the time was slightly longer, 131.84 minutes. But the time from ambulance arrival to the patient was definitely unalike depending on a patient's place of living. It took longer to visit a patient living in the country than in the city, the difference makes 9.87 minutes.

Moreover, the emergency team needed noticeably longer time to deliver to the hospital a patient from outside the city, comparing to those from inside the city. That difference made 18.38 minutes.

There was a difference between time spent from the beginning of chest pain to bringing the patient to the hospital, comparing the city and the country. It was 17.25 minutes.

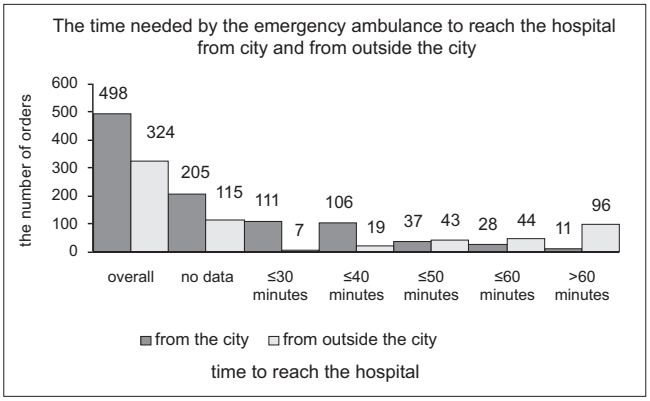


Source: order cards form emergency ambulance service in Słupsk

FIGURE 2. Description of the number of the emergency service orders to the patients suffering from the chest pain compared to the time of arrival (in minutes).

Time the ambulance needed to come to the patient in the city in 77.6% did not exceed 8 minutes. In 4.6% cases, it took more than 15 minutes. The shortest time needed by the ambulance to arrive to the patient inside the city was 4 minutes. The longest one amounted 29 minutes. The most frequent time was 6 minutes. The median was also 6 minutes.

The time which the emergency team needed to arrive to the patient in the village in 37.9% was not more than 15 minutes, in 40.8% of cases it was 20 minute from the call. The shortest time needed by the ambulance to come to the patient outside the city was 4 minutes. The longest one amounted to 37 minutes. The most frequent time was 14 minutes. The median was 18 minutes.



Source: order cards form emergency ambulance service in Słupsk

FIGURE 3. Description of the number of transported patients by the emergency rescue units, compared to the time of arriving to the hospital with the patient (in minutes).

The most numerous group of patients with chest pain (74.1%) was transported to the hospital from the area of the city within 30–40 minutes and 37.9% of patients were carried to the hospital after less than 30 minutes, meanwhile, it took 40 minutes to deliver 36.2% of the sick. From outside of the city, only 3.3% of patients were managed to have been transported within 30 minutes while in 9.1% the time was more than 40 minutes. The longest time, more than 60 minutes, it took emergency rescue units to come with the patients to the hospital in 3.6% of cases in the city and in 45.9% outside it.

The shortest time measured from receiving a call to admitting the patients to the hospital within the city was 18 minutes. The longest time was 69 minutes. The most frequent one was 28 minutes. The median is therefore 37 minutes.

However, the emergency rescue units needed 26 minutes at least to get with the sick from the country to the hospital, while the longest time was 78 minutes. Most frequently they needed 64 minutes. The median here was 57 minutes.

DISCUSSION

One of causes of great number of deaths because of myocardial infarction is too late initiation of the treatment. Shortening of the time between the start of pain and applying the treatment would be crucial when lowering the death rate of those patients. It is assessed that more than half of all the patients die within the first hours since the first symptoms, before getting to the hospital [1, 2].

According to the research, patients suffering from the chest pain were waiting with calling the ambulance to almost 2 hours, regardless the place of living. In every group of patients, the time between the start of the pain and the call for an ambulance was 10 to 840 minutes, the average lag time was 115 minutes. The median here was 90 minutes. The most frequent amount of time in the city was 20 minutes, while the lag time from outside the city was 120 minutes. According to Walkiewicz et al. the time from the start of the pain and the call fluctuates around from 4 to 1140 minutes, in other words 19 hours, 108 minutes on average, the median – 45 minutes [3].

Rescue medicine does not influence directly the lag time from the start of chest pain- what it may affect – is the time the ambulance needs to get to the patient's house and to the hospital with at the ill.

Słupsk county is quite a vast area for emergency rescue units from Słupsk. The county covers 175 villages (smallest administrative units, usually comprised of a single village – translation footnote) and 327 towns. The area is 2 304 km^2 and the city of Słupsk is 43.15 km^2 big. Słupsk county has the population of 191 826 (2005), including the population of the city of 99 589 (2005) [4].

The distance of 40–50 km to the patients' place keeps preventing the emergency rescue units from getting to all patients quickly. There are places 45–46 km away from the emergency rescue unit base in Słupsk, such as Gać and Cecenowo in Główczyce district, or Smołdzino and Czołpino, 42–50 km away from the sub base in Potęgowo [5].

According to the research, in almost 40% of situations, the time the emergency rescue unit needs to get to the patient outside the city exceeds 20 minutes. The Act of National Medical Rescue states clearly that the median of time taken to get to the patient outside the city cannot be more than 15 minutes, the maximum time must not be more than 20 minutes [6]. The Pomeranian voivode, in his plan of medical security, specified the time of ambulance's getting to the patients not more than 20 minutes, considering the place of residence each ER unit and its operation area [7].

In 50% of cases, the time of getting to the patients from outside the city and delivering him/her to the hospital was over 60 minutes.

In the system of emergency medicine, it is focused to the organization charts, fast and easily accessible emergency medicine based on the idea of "the chain of surviving". The therapeutic procedures within the hospital should not be applied later than 30–40 minutes from the "emergency" signal sent from the patient [8].

In the plan of medical security for Słupsk, one more subunit was to be established, in Główczyce. It has been working since February 2008. Its operation area covers 4 nearby districts: Główczyce, Smołdzino, Potęgowo and Damnica [7], the farther place from existing stations. Due to the one emergency service unit the shorter time of getting to the patients can be expected.

CONCLUSIONS

1. The place of living of a sick person did not influence crucially the time of making a call for emergency team. The sick waited with calling an ambulance for almost

2 hours, however, people living in the village decided a bit earlier to call for help.
2. The place of ambulance premises and the operation area affected significantly the time spent on getting to the patients and delivering them to the hospital. Almost 50% of patients from outside the city waited for an ambulance for 20 minutes, and were admitted to the hospital after 60 minutes. It happens this way probably because of the lack of the subunit within the distance of 40–50 km in case of towns such as Smołdzino and Główczyce.
3. Over 75% of patients from the city calling an ambulance because of chest pain, had to wait for it for less than 8 minutes, being transported to the hospital within 30–40 minutes. The fact that the emergency service units was in a state of alert in Słupsk base or Ustka sub base is of the essential importance to shorten the time of patient's waiting.

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