Research Letter

Assessment of patients' attendance at outpatient clinics and prehospital therapy: Russian acute coronary syndrome registry LISS-3 data

Attendance prior to ACS was generally higher in patients with established CVD and in patients with evident risk factors. The overall quality of prehospital therapy was better in patients with higher attendance rate, however, even in attendants it was far from that recommended by current clinical guidelines.

Objective: Despite greater use of modern medication therapy, effective reperfusion therapy and primary percutaneous coronary interventions, mortality following acute coronary syndrome (ACS) remains substantial [1,2]. Prehospital therapy is one of the components that influences outcomes of a disease [3]. Its quality may depend on different factors: quality of identification of high risk patients, physicians' adherence to use of clinical guidelines in their practice, patients' adherence to doctors' recommendations [4]. The aim of the present study was to analyze patients' attendance at outpatient clinics (OC) prior to the development of ACS and its influence on the quality of their prehospital therapy.

Methods: For this part of the study (from November 1, 2013 to July 31, 2015) we used the data of the LISS-3 (Lyubertsy Infarct Survival Study) hospital registry. All survived patients hospitalized with ACS (n = 320) were asked to fill out the questionnaire about regularity of attendance at OC prior to ACS, medical history and prehospital therapy taken for at least 2 months before hospitalization. We analyzed only prehospital therapy taken by patients and not therapy recommended to patients by their doctors but neglected by them. Patients were divided into three groups depending on their rate of attendance: attendants – patients, who visited a primary care physician or cardiologist at OC once a year or more often (n = 139); patients with partial attendance – those, who visited their primary care physician less than once a year, visited their doctor irregularly (n = 103); non-attendants – those, who had never visited a primary care doctor prior to ACS (n = 78).

Results: Table 1 compares general characteristics of the 3 groups of patients. Patients with partial attendance had a higher rate of attendance compared to non-attendants. Patients with higher rate of attendance were more often smokers, were younger, had more heart diseases and more often had a history of cardiovascular risk factors. Patients' adherence to doctors' recommendations and higher rate of attendance were positively associated.

Table 1
Baseline characteristics of the patients of the three groups with different rates of attendance at outpatient clinics.

| Socio-demographic characteristics | Attendants (n = 139) | Patients with partial attendance (n = 103) | Non-attendants (n = 78) | p-value | OR (95%CI) | p-value |
|----------------------------------|---------------------|------------------------------------------|------------------------|---------|-----------|---------|
| Age Median [25%; 75%] | 73 [61; 78] | 62 [55; 74] | 57 [30; 64] | 0.0001 | 1.742 | 1.022–2.968 | 0.041 |
| Higher education level | 42 (31.1%) | 22 (22.4%) | 22 (28.6%) | 0.340 | 1.753 | 1.014–3.029 | 0.044 |
| Married (data available for 310 patients of 320) | 89 (66.9%) | 77 (78.6%) | 61 (80.3%) | 0.048 | 0.968 | 0.530–1.766 | 0.915 |
| Employed (data available for 314 patients of 320) | 28 (20.3%) | 43 (43.4%) | 44 (57.1%) | 0.0001 | 0.048 | 0.271–0.877 | 0.016 |
| History of cardiovascular risk factors | | | | | | |
| Obesity (data available for 307 patients of 320) | 52 (39.7%) | 41 (41.8%) | 24 (30.8%) | 0.287 | 1.231 | 0.738–2.053 | 0.426 |
| Smoking | 26 (18.7%) | 41 (39.8%) | 45 (57.7%) | 0.0001 | 0.526 | 0.286–0.967 | 0.039 |
| Sedentary lifestyle (data available for patients 318 of 320) | 94 (67.6%) | 46 (45.1%) | 30 (39.0%) | 0.0001 | 2.021 | 1.230–3.320 | 0.005 |
| Family history of CVD (data available for 282 patients of 320) | 25 (19.8%) | 10 (11.9%) | 8 (11.1%) | 0.154 | 2.075 | 0.998–4.312 | 0.051 |
| History of dyslipidemia | 23 (16.5%) | 13 (12.6%) | 0 (0.0%) | 0.001 | 3.095 | 1.417–6.763 | 0.003 |
| History of diabetes mellitus | 44 (31.1%) | 17 (16.5%) | 7 (9.0%) | 0.0001 | 2.482 | 1.366–4.509 | 0.003 |
| History of CVD | | | | | | |
| No diagnosed CVD prior to ACS | 8 (5.8%) | 20 (19.4%) | 44 (56.4%) | 0.0001 | 0.171 | 0.077–0.383 | 0.0001 |
| History of ischemic heart disease | 73 (52.5%) | 30 (29.1%) | 9 (11.5%) | 0.0001 | 3.828 | 2.239–6.544 | 0.0001 |
| History of myocardial infarction | 37 (26.6%) | 11 (10.7%) | 3 (3.8%) | 0.0001 | 4.163 | 2.028–8.542 | 0.0001 |
| History of arterial hypertension | 121 (87.1%) | 76 (73.8%) | 31 (39.7%) | 0.0001 | 2.925 | 1.582–5.407 | 0.0001 |
| History of atrial fibrillation | 4 (2.9%) | 5 (4.9%) | 0 (0.0%) | 0.147 | 0.571 | 0.140–2.327 | 0.434 |
| History of stroke | 18 (12.9%) | 4 (3.9%) | 2 (2.6%) | 0.005 | 3.360 | 1.242–9.091 | 0.017 |

a x² test was used for comparative analysis of categorical variables.
b Kruskal–Wallis test was used for qualitative variables with the non-normal distribution.
c Binary logistic regression adjusted to age and gender using Group A versus group B + C (with determination of Odds ratio, 95% confident intervals and p values) was used to determine factors associated with attendance at outpatient clinics.
d Data was received from patients themselves and reflects patients' knowledge of their medical, social and family history.

http://dx.doi.org/10.1016/j.ihj.2016.11.005
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of attendance. Few patients in all groups were informed about the presence of hyperlipidemia, however, blood tests performed in hospital showed that most of patients had increased cholesterol level. Patients with ischemic heart disease (IHD) were generally more compliant with attendance at OC, however, a large group of patients with history of IHD had low attendance rate prior to ACS. Although the use of medications with proven positive influence on CVD outcomes increased with the increase of attendance rate, the use of statins, antiplatelets, \(\beta\)-blockers, antihypertensive drugs was insufficient even in attendants (Table 2). On the other hand, patients of the 3 groups did not differ in the use of diuretics, nitrates, calcium antagonists, antiarrhythmic drugs.

**Conclusions:** Our study shows that attendance prior to ACS was generally higher in patients with established CVD and in patients with evident risk factors, except smoking. Many patients were unaware of hyperlipidemia, even those with high attendance rate. The overall quality of prehospital therapy was better in patients with higher attendance rate, however, even in attendants the quality of primary and secondary medical prevention was far from that recommended by current clinical guidelines.

**Authors’ contributions**

Martsevich S.Yu.: substantial contributions to conception and design; revising the article critically for important intellectual content; final approval of the version to be published.

Semenova Yu.V.: analysis and interpretation of data; drafting the article.

Kutishenko N.P.: substantial contributions to conception and design; revising the article critically for important intellectual content.

Ginzburg M.L.: substantial contributions to conception and design.

**Conflicts of interest**

The authors have none to declare.

**Acknowledgements**

We thank Alexandr V. Zagrebelnyy, Anna V. Fokina, Elena V. Daniels for their contribution to the study. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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