Epidemiological analyses for preparation of CPG related to Acute Coronary Syndromes in the Czech Republic

Miloslav Klugar PhD, Martin Hunčovský MPH, A/Prof Andrea Pokorná PhD, Dana Dolanová PhD, Klára Benešová MSc, Jiří Jarkovský PhD, Jan Mužík PhD, Radim Líčeník MD PhD, Tomáš Nečas MD, Petra Búřilová BA, Prof Ladislav Dušek PhD, Jitka Klugarová PhD

Masaryk University GRADE Centre
Czech CEBHC JBI Centre of Excellence
Disclosures

• no direct conflict of interest of any author
• possible indirect conflict of interest
  – dr. Klugar is the president of the symposium and Chair of European Joanna Briggs Collaboration Centre
Aim

- basic clinical overview of acute coronary syndrome (ACS)
- provide current ACS prevalence and incidence data from the Czech Republic
  - analyses are part of ACS clinical practise guideline development process
  - Institute of Health Information and Statistics of the Czech Republic provided the data
    - primary source: National Register of Reimbursed Health Services
Acute coronary syndrome

• clinical syndrome due to decreased blood flow in the coronary arteries

• major cause of death worldwide

Images:
https://www.news-medical.net/health/What-is-Coronary-Heart-Disease.aspx
Acute coronary syndrome

One disease process but different clinical manifestations and different management strategies

First Medical Contact (FMC) | Chest pain
---|---
Working diagnosis | Acute coronary syndrome
ECG | Persistent ST-elevation
Biochemistry | ST/T - abnormalities
Imaging | Normal or undetermined ECG
Diagnosis | Troponin rise/fall

Troponin rise/fall | STEMI
---|---
Troponin rise/fall | NSTEMI
Troponin normal | Unstable angina

http://www.metalyse.com/resources/slides

Masaryk University
GRADE Centre
Cochrane Czech Republic
Czech CEBHC JBI Centre of Excellence
Acute coronary syndrome

Epidemiology
Patients with ACS were identified by following criteria:

- **unstable angina (UA):** I20.0 diagnosis reported
- **non-ST elevation myocardial infarction (NSTEMI):** I21.4 diagnosis reported
- **ST elevation myocardial infarction (STEMI):** I21.0–I21.3, I21.9 or I22 diagnoses reported (all subcategories included)
- **acute myocardial infarction total (AMI):** I21 or I22 diagnoses reported (all subcategories included)

- **source:** National Register of Reimbursed Health Services
The number of hospitalized cases of acute coronary syndrome decreased slightly in individual years, in 2017 there were 15,000 cases of acute myocardial infarction and 3,5 thousand cases of unstable angina.
Non-ST elevation myocardial infarction (NSTEMI)

Epidemiology
Demographic profile of patients hospitalized for NSTEMI in 2017

Sex and age structure of cases:

<table>
<thead>
<tr>
<th>Age</th>
<th>Man: N (2017)</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>3904</td>
<td>67.7 (11.9)</td>
<td>69 (60; 76)</td>
</tr>
<tr>
<td>15-24</td>
<td>4553</td>
<td>70.2 (13.5)</td>
<td>72 (68; 76)</td>
</tr>
<tr>
<td>25-34</td>
<td>4059</td>
<td>71.2 (14.2)</td>
<td>74 (70; 78)</td>
</tr>
<tr>
<td>35-44</td>
<td>3428</td>
<td>72.1 (14.9)</td>
<td>75 (72; 79)</td>
</tr>
<tr>
<td>45-54</td>
<td>2825</td>
<td>73.0 (15.6)</td>
<td>76 (73; 80)</td>
</tr>
<tr>
<td>55-64</td>
<td>2178</td>
<td>73.9 (16.2)</td>
<td>77 (75; 81)</td>
</tr>
<tr>
<td>65-74</td>
<td>1691</td>
<td>74.8 (16.8)</td>
<td>78 (76; 82)</td>
</tr>
<tr>
<td>75-84</td>
<td>1239</td>
<td>75.7 (17.4)</td>
<td>79 (77; 83)</td>
</tr>
<tr>
<td>85-94</td>
<td>873</td>
<td>76.6 (18.0)</td>
<td>80 (78; 84)</td>
</tr>
<tr>
<td>95+</td>
<td>501</td>
<td>77.5 (18.6)</td>
<td>81 (79; 85)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Woman: N (2017)</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>2308</td>
<td>74.2 (11.8)</td>
<td>76 (67; 83)</td>
</tr>
<tr>
<td>15-24</td>
<td>1824</td>
<td>77.1 (13.0)</td>
<td>80 (76; 84)</td>
</tr>
<tr>
<td>25-34</td>
<td>1559</td>
<td>78.0 (13.6)</td>
<td>82 (78; 86)</td>
</tr>
<tr>
<td>35-44</td>
<td>1297</td>
<td>78.9 (14.2)</td>
<td>83 (80; 87)</td>
</tr>
<tr>
<td>45-54</td>
<td>1067</td>
<td>79.8 (15.0)</td>
<td>85 (82; 89)</td>
</tr>
<tr>
<td>55-64</td>
<td>870</td>
<td>80.7 (15.6)</td>
<td>87 (84; 91)</td>
</tr>
<tr>
<td>65-74</td>
<td>692</td>
<td>81.6 (16.2)</td>
<td>89 (86; 93)</td>
</tr>
<tr>
<td>75-84</td>
<td>540</td>
<td>82.5 (16.8)</td>
<td>91 (88; 95)</td>
</tr>
<tr>
<td>85-94</td>
<td>356</td>
<td>83.4 (17.4)</td>
<td>92 (89; 96)</td>
</tr>
<tr>
<td>95+</td>
<td>210</td>
<td>84.3 (18.0)</td>
<td>93 (90; 97)</td>
</tr>
</tbody>
</table>

Non-ST elevation myocardial infarction is more common in males (64%) than in females (36%). Men are reported on average at a lower age than women (68 vs. 74 years).
Age-specific prevalence NSTEMI

The proportion of hospitalized NSTEMI cases in relation to the population of the Czech Republic in individual age groups:

- 0.0% for patients 0-4 years
- 0.1% for patients 5-9 years
- 0.2% for patients 10-14 years
- 0.3% for patients 15-19 years
- 0.4% for patients 20-24 years
- 0.5% for patients 25-29 years
- 0.6% for patients 30-34 years
- 0.5% for patients 35-39 years
- 0.4% for patients 40-44 years
- 0.4% for patients 45-49 years
- 0.4% for patients 50-54 years
- 0.4% for patients 55-59 years
- 0.4% for patients 60-64 years
- 0.4% for patients 65-69 years
- 0.4% for patients 70-74 years
- 0.4% for patients 75-79 years
- 0.5% for patients 80-84 years
- 0.5% for patients 85-89 years
- 0.6% for patients 90-94 years
- 0.6% for patients 95+

Proportion of hospitalized cases of patients in specific age

Age of patients (2017)

Source: NRHZS 2017; hospitalized NSTEMI cases in 2017 (N = 6 134)

The proportion of cases of NSTEMI patients is gradually increasing with age to 0.5% for men and almost 0.4% for women relative to Czech population. Most cases are in patients aged 60-85 years.
ST elevation myocardial infarction (STEMI)
Epidemiology
STEMI is more often reported in man (66%) than in woman (34%) which is slightly different from NSTEMI. Man are reported in younger age (average 65 years) than woman (average 73 years).

<table>
<thead>
<tr>
<th></th>
<th>Men (2017)</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>64.9 (12.4)</td>
<td>65 (57; 73)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Women (2017)</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>2 978</td>
<td>73.2 (12.5)</td>
<td>74 (66; 83)</td>
</tr>
</tbody>
</table>

Zdroj dat: NRHZS 2017; hospitalizované případy STEMI/AIM neurčeného v roce 2017 (N = 8 878)
Unstable angina (UA)
Epidemiology
Number of hospitalized UA cases by region of residence in relation to the population of the region

The highest number of reported hospitalized cases of UA per 100,000 inhabitants was recorded in the South Bohemian Region (0.07% of the population), while the lowest number was in the Plzeňský Region, Capital City of Prague, Central Bohemia, South Moravia and Olomouc Region (0.02 % of population), even after age standardization. In the Czech Republic there were 34 cases per 100,000 inhabitants in 2017.
Conclusions

• decrease in ACS cases in Czech Republic since 2015

• gender difference remains large
  – majority (two thirds) of those hospitalized for unstable angina, NSTEMI or STEMI are men
  – men are hospitalized in younger age than women

• STEMI patients, both women and men are hospitalized in younger age compared to NSTEMI and UA

• main limitation: just reimbursed care data