Tobacco Consumption and Acute Myocardial Infarction

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SUMMARY

Introduction: Smoking: a coronary risks factor that enhance Acute Myocardial Infarction (AMI) probability, but some international surveys showed that smokers with a AMI have lower mortality In our country there's not any survey on this topic.

Objectives: Evaluating the link between smoking and AMI clinical features and in-hospital mortality.

Methods: We performed a revision trial of 1259 AMI patient's admitted since 1987 to 1997. We selected two populations (tobacco consumers and never tobacco consumers), and we analyzed: gender and age distribution, topography, clinically hemodynamic classification, thrombolytic administration and mortality on both groups.

Resulted: Of 1259 admitted patients, 39% were tobacco consumers (current smokers and former smokers), and they were: more men than women (89% vs. 57%), ten years younger (59,6 vs. 69,5), more frequent non anterior topography (41% vs. 34%), they received thrombolytic in more occasions (47% vs. 39%) and they showed higher mortality reduction with thrombolytic therapy (58% vs. 20%).

Discussion and conclusion:
1) It was confirmed in our country, like others, that tobacco consumers have lower AMI in-hospital mortality, probably because they had a better clinical profile: they were younger and had more non anterior AMI, they were predominantly men, and received more thrombolytic therapy.
2) Thrombolytic therapy would be more effective in tobacco consumers, and it suggested that in this population thrombotic factors were predominant.
Both observations require multifactorial analysis.

BACKGROUND

Acute Myocardial Infarction (AMI) has been one of the most studied pathological medical condition in last decades. Over 100.000 patients has been included in many clinical trials, increasing knowlege about pathogenic, physiopatologic, epidemiologist, clinical and therapeutic aspects. Otherwise, tobacco consumption has been defined as a major risk factor for AMI (1). In spite of it, many scientific trials, in thrombolytic and pre-thrombolytic eras informed about "the smoker's paradox", where this population would have lesser mortality and better prognostic in AMI (2) (3) (4).

In Uruguay, there would be 3400 new cases of AMI by year, but very few trials have been performed about it. The most important trial was EMUFI, 309 patients were included (5), but no trial on tobacco consumption and AMI was realized.

OBJECTIVES

Our purpose was to evaluate the relation between tobacco consumption and the outcomes and mortality of AMI patients admitted to an Uruguayan Cardiac Care Unit.

MATERIAL AND METHODS

We revised clinical records of 1259 of AMI diagnosed patients, admitted between June/1987 and June/1997 in Association Española de Socorros Mutuos (AEPSM) of Montevideo.

A database with patients clinical features was made. AMI diagnostic was based on at least two of this features: new Q waves , angina-like chest pain and/or enzymatic increasing.

We defined anterior AMI to those where anterior and/or lateral walls were affected, and inferior AMI to
those where inferior and/or basal were. Multiple AMI were those where necrosis reach both areas in any kind.

Two populations were analyzed:
1) Tobacco Consumers, defined as those who registered smoking antecedent in clinical records, including both current smokers and former smokers. Usually, many Uruguayan's physicians didn't separate between current smokers and former smokers in clinical records, just register tobacco consumption, and any data subregister is also possible.
2) No tobacco consumers (those who has never consumed).

Gender and age distribution, topography, functional status (Killip and Kimbal), treatment and mortality were analyzed.

Statistical analysis: odds ratio, chi test and p value, were performed.

RESULTS
At this period, 11,969 patients were admitted in our CCU, and 1259 were diagnosed as AMI (10.2%). Age mean was 65,5 years (men 63 years and women 71,5 years). Age distribution per decades are showed in next Figure 1.

Among patients admitted, 487 (39%) were tobacco consumers and 772 (61%) were non tobacco consumers. If we consider just patients younger than 65 years, 497 patients (39%), we find 302 (61%) were tobacco consumers and 195 (39%) were non tobacco consumers.

When we consider differences according to gender we observe that: 874 (69%) were men and 380 (31%) were women. As for tobacco consumers: 436 (89%) were men and 50 (11%) were women. Non consumers: 438 (57%) were men and 330 (43%) were women. Of the total AMI admitted patients, 50% of men and 13% of women were tobacco consumers.

Regarding distribution by decades: (Table 1)

<table>
<thead>
<tr>
<th>Years</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
<th>70-79</th>
<th>80-89</th>
<th>90-99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers</td>
<td>19</td>
<td>75</td>
<td>135</td>
<td>155</td>
<td>38</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Non consumers</td>
<td>2</td>
<td>16</td>
<td>108</td>
<td>228</td>
<td>217</td>
<td>157</td>
<td>21</td>
</tr>
</tbody>
</table>

Age mean: considering the whole population it was 65 years, between tobacco consumers it was 59,6 and non tobacco consumers: 69,5 years. According to sex: between men, it was 59,5 years in tobacco consumers and 66,7 years in non consumers. As for women: 62,7 and 72,8 years, respectively. Regarding
AMI topography:
We observed that in the consumer population 40% (190) had anterior infarction, 41% (199) inferior infarction, 12% (62) non Q wave infarction, as for non consumers population: 43% (331) had anterior, 34% (262) inferior and 14,5% (112) non Q wave infarctions.

Regarding functional status: (Table 2)

<table>
<thead>
<tr>
<th>Functional Status</th>
<th>KKI</th>
<th>KKII</th>
<th>KKIII</th>
<th>KKIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers</td>
<td>424(87%)</td>
<td>37(7.6%)</td>
<td>14(2.5%)</td>
<td>13(2.7%)</td>
</tr>
<tr>
<td>Non consumers</td>
<td>613(80%)</td>
<td>79(10%)</td>
<td>37(4.8%)</td>
<td>40(5.2%)</td>
</tr>
</tbody>
</table>

We define three therapies: 1) Usual therapy (analgesics, aspirin, betablockers, nitrates and/or ACE inhibitors), it was used in 734 (58%) patients. 2) Thrombolytic therapy: based in streptokinase (STK) or recombinant tissue plasminogen activator (rt-PA), was used in 449 (405) cases. 3) Primary angioplasty: 26 patients (2%). Regarding thrombolytic therapy it was used in 47% (257/487) of consumers and just 39% (269/772) non consumers.

When mortality is considered we find that in the whole population it was 9.6% (121/1259), between consumers it was 6% (29/487) and non consumers 12.8% (99/771).

When mortality is considered related to gender, we find that: (Table 3)

<table>
<thead>
<tr>
<th></th>
<th>Global</th>
<th>Non consumers</th>
<th>Consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEN</td>
<td>7.5% (66/874)</td>
<td>8.5% (38)</td>
<td>6.4% (28)</td>
</tr>
<tr>
<td>WOMEN</td>
<td>14.5% (57/390)</td>
<td>16% (54)</td>
<td>2% (1)</td>
</tr>
</tbody>
</table>

In men, consumer's mortality was 6.4% (28 cases) and non consumer's 8.6% (38 cases). As in women, consumer's mortality was 2% (1 case) and non consumer's 16% (54 cases).

Mortality in relation with functional status:
Consumers: KK I 2.8%; KK II 2.7%; KK III 21%; KK IV 46%
Non consumers: KK I 7%; KK II 26%; KK III 16%; KK IV 75%.

Mortality in relation with thrombolytic therapy: (Table 4)

<table>
<thead>
<tr>
<th></th>
<th>Global</th>
<th>Thrombolytics</th>
<th>Non thrombolytics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>9.6%</td>
<td>7.2%</td>
<td>11.7% (p&lt;0.05)</td>
</tr>
<tr>
<td>Non consumers</td>
<td>12.8%</td>
<td>11%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Consumers</td>
<td>6%</td>
<td>2.8%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

DISCUSSION
In this population, even with the bias mentioned before, we find that tobacco consumption had a higher relation with AMI admission in younger than 65 years. Mean age in consumers was 10 years lower than non consumer. Regarding gender, relation between tobacco consumption and AMI was highest in men (50%) than women (13%). This fact might be related to the tobacco epidemic stage in our country, where men would be declining in their consumption and damage related to tobacco, while women is just reaching their highest level and starting to suffer from tobacco related diseases (8).

When topography is considered, a higher incidence of inferior AMI is observed in consumers than non consumers. Regarding functional status, there was not observed differences between both groups.
In relation with thrombolytic therapy, consumers received more thrombolytics than non consumers, and this therapeutic decrease mortality in consumers in higher proportion also (58% vs. 20%).

In relation to global mortality, tobacco consumers showed apparently a minor mortality at any age than non consumer, as in men and women, like as it was observed in other countries.

At the Israeli Thrombolytic National Survey (2), that studied the relation between smoking and 30-day and 6-month mortality after AMI, showed that consumer's mortality was 6% and non consumer's 15.7%. This trial find that smokers were on average 10 years younger, more frequently men than women, more inferior AMI, less frequently with previous infarction or a history of angina, hypertension, diabetes than non smokers. Smokers also had a lower incidence of congestive heart failure on admission, received more frequently thrombolytics and aspirin. After adjustment for age, gender, thrombolytic therapy, and others clinical baseline characteristics, no significant difference in mortality was observed between smokers and non smokers. The model had a power of 0.80 for OR 0.50, with alpha 0.1.

Ishibara (6) studied acute angiography features in AMI, and their association with smoking consumption, finding that after thrombolytics the infarct artery of smokers responded more efficiently (TIMI 3 32% vs. 18%), and this fact associated with better risk profile could explain the better AMI prognosis in smokers.

CONCLUSIONS

1) Apparent better prognoses of tobacco consumers AMI could be explained by a more benign risk profile at admission (age, sex, topography, thrombolytic therapy, etc).

2) Major efficient response to thrombolytic therapy in tobacco consumers suggest that in their AMI physiopatology could have more influence thrombosis factors than in non consumers.

REFERENCES


2. Smoking and Prognosis After Acute Myocardial Infarction in the Thrombolytic Era (Israeli)


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