Natural History of the Ischemic Heart Disease, especially of the Myocardial Infarction

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The natural history of the ischemic heart disease, especially of the myocardial infarction was studied from the viewpoint of pathophysiology.

Materials and Methods

Sixteen patients with coronary sclerosis (which had ST-T changes and no anginal attack), 19 patients with angina pectoris and 51 patients with myocardial infarction were studied. The patients with myocardial infarction were aged 30 to 72 years, and the age grouping of cases was shown in Fig.1 and Fig.2. The localization of myocardial infarction was shown in Table 1. At the time of study at least ten days had elapsed since the initial attack.

Coronary sinus, right heart and transseptal left heart catheterization were performed. Coronary blood flow was measured by the nitrous oxide method. Cardiac index was measured by the dye dilution method.

All cases were followed up as long as possible and at least for several years.

Results and Discussion

1. Myocardial infarction

Decreased oxygen tension in the coronary sinus blood (PcsO₂) were seen in many of the cases examined within three months after the attack, but rarely thereafter. Although gross changes detected by local coronary venous sampling were not observed in coronary sinus blood samples, decreased PcsO₂ implies hypoxia of the left ventricular myocardium, i.e. coronary insufficiency. Therefore, coronary insufficiency was seen in many cases within three months of an attack, but seldom after that time.

Signs of left heart failure, such as elevated left atrial pressure (PLA), decreased stroke volume

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Fig. 1. At the time of the attack.

![Graph](image1)

Fig. 2. At the time of the catheterization.

![Graph](image2)

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Key Words: Myocardial Infarction, Natural History, Coronary Sinus Blood, Left Heart Failure

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index (SI) were seen in a few cases within three months of the attack. Signs of left heart failure, sometimes advanced, were also seen after three months.

From two months to twelve years after the study, 16 cases died of cardiac accidents. At the time of catheterization, decreased $P_{\text{CO}_2}$ was seen only in 5 of the 16 cases, but elevated $P_{\text{LA}}$ was seen in 10 of the 16 cases, especially 8 of 10 cases who died within five years after the study.

A comparison was made of the data of the 10 cases (who died within five years) with those that survived more than five years after the catheterization. The survived group was divided into four classes according to the functional classification of New York Heart Association. $P_{\text{CO}_2}$ showed no marked differences between the two groups. Therefore, the influence of coronary insufficiency on the late mortality from myocardial infarction was not clear. However, the $P_{\text{LA}}$ value was quite different in both groups. $P_{\text{LA}}$ was 17.2 ± 8.6 mmHg in the cardiac death group, 12.1 ± 3.0 mmHg in IV class, and 8.7 ± 3.8 mmHg in I–III classes of the survived group. Mean value of $P_{\text{LA}}$ in the cardiac death group and in IV class were significantly higher than that of I–III classes ($P<0.005$) (Fig.3). Similarly, mean value of stroke volume index (SI) in the cardiac death group was significantly smaller than that of I–III classes ($P<0.05$) (Fig.4). Therefore, cases with signs of left heart failure had a poor prognosis within five years. Especially elevated $P_{\text{LA}}$ correlated better with the late mortality from myocardial infarction.

2. Coronary sclerosis and angina pectoris

In cases with coronary sclerosis and angina pectoris no definite correlation was found between the pathophysiology and the natural history.

After the catheterization, myocardial infarction occurred in 14 cases, i.e., in 6 cases with coronary sclerosis, in 4 cases with angina pectoris, and in 4 cases with myocardial infarction (re-attack). $P_{\text{CO}_2}$ was studied in these 14 cases. In Fig.5 ordinate is $P_{\text{CO}_2}$ and abscissa is the duration after the catheterization.

![Figure 3](image3.png)

**Fig.3.**

![Figure 4](image4.png)

**Fig.4.**

![Figure 5](image5.png)

**Fig.5.**

**TABLE 1** AREA OF MYOCARDIAL INFARCTION

<table>
<thead>
<tr>
<th>Location</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior (or Anteroseptal)</td>
<td>24</td>
</tr>
<tr>
<td>Inferior</td>
<td>12</td>
</tr>
<tr>
<td>Lateral</td>
<td>3</td>
</tr>
<tr>
<td>Posterior</td>
<td>1</td>
</tr>
<tr>
<td>Combined</td>
<td>11</td>
</tr>
</tbody>
</table>

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duration from the catheterization to the attack of myocardial infarction. Even a case which fell an attack of myocardial infarction within twenty four hours did not show decreased $P_cS_O_2$. Therefore, the attack of myocardial infarction was not predicted by decreased $P_cS_O_2$.

**SUMMARY**

From the data of the cardiac catheterization the natural history of the ischemic heart disease, especially of the myocardial infarction was studied.

1. Coronary insufficiency was seen in many cases within three months after the initial attack of myocardial infarction, but rarely thereafter.

2. The late mortality and the attack of myocardial infarction were not predicted by decreased oxygen tension in the coronary sinus blood.

3. Cases with signs of left heart failure had a poor prognosis within five years.

**REFERENCES**
