RESULTS OF A CLINICAL STUDY OF DIFFERENT CONCENTRATIONS OF ALCOHOL IN THE BLOOD

by

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Swedish legislation dealing with alcohol and road traffic stipulates a permitted level of alcohol in the blood. The legislation also provides for the taking of a blood test in the case of a motorist suspected of driving under the influence of alcohol. When such a blood test is sent in to the laboratory for analysis, it is accompanied by a doctor’s report on the clinical examination.

However, it has become apparent in Sweden as well as in other countries that such a clinical examination does not provide a reliable basis for determining the degree of influence. For this reason a new type of doctor’s report has been tried out for some time in Sweden. This involves more tests than previously and the doctor is required to give an account of the tests instead of simply answering “Yes” or “No” to the printed form questions previously used. Another important change is that in his conclusion the doctor has to state only whether the person in question is under the influence of drink or not. Thus the doctor is not requested to give an opinion as to the person’s ability to drive a motor vehicle.

As this new type of doctor’s report has been in use for some time and the doctors have by now got used to it, Professor Bonnichsen and I have made a comparison of the concentrations of alcohol in the blood with the conclusions of the doctors as to whether the persons examined were under the influence of alcohol to the following degrees: “Not,” “Slightly,” “Medium,” or “Heavily.” A total of 950 doctors’ reports has been examined. However, 82 of the cases have not been included in the study for the following reasons:

- Death ............................................................... 9
- Skull fractures, concussions of the brain ............................................................. 11
- Unclear definition ........................................ 18
- Doctor on the report noted only “under the influence of alcohol” .......................... 24
- Data on concentration of alcohol in the blood not available .......................... 14
- Other reasons ................................................. 6

Previous surveys have shown that there is a certain difference in determining the degree of influence between doctors in different places. For this reason the authors have divided up the material with reference to the origin of the blood tests, namely into those taken in Sweden’s largest three cities (Stockholm, Göteborg, and Malmö), those taken in towns, and those from rural districts:

- Cities ........................................ 213 (24.5%)
- Towns ........................................ 441 (50.8%)
- Rural districts ...................... 214 (24.7%)

In the following table the total number of cases has been divided up according to the concentration of alcohol in the blood and the doctors’ statements as to the degree of influence.
Table I

Doctors' Statements as to the Degree of Influence

<table>
<thead>
<tr>
<th></th>
<th>Cities</th>
<th>Towns</th>
<th>Rural Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per ml</td>
<td>Not</td>
<td>Slightly Influenced</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0-0.49</td>
<td>11</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>0.5-0.99</td>
<td>14</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>1.0-1.49</td>
<td>13</td>
<td>36</td>
<td>10</td>
</tr>
<tr>
<td>1.5-1.99</td>
<td>4</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>2.0-2.49</td>
<td>1</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>2.5-2.99</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>3.0-3.49</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percentage distribution of concentration of alcohol in the blood for all cases, Sweden as a whole.

<table>
<thead>
<tr>
<th>Per ml</th>
<th>Percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.49</td>
<td>12</td>
</tr>
<tr>
<td>0.5-0.99</td>
<td>20</td>
</tr>
<tr>
<td>1.0-1.49</td>
<td>27</td>
</tr>
<tr>
<td>1.5-1.99</td>
<td>22</td>
</tr>
<tr>
<td>2.0-2.49</td>
<td>13</td>
</tr>
<tr>
<td>2.5-2.99</td>
<td>5</td>
</tr>
<tr>
<td>3.0-3.49</td>
<td>1</td>
</tr>
</tbody>
</table>

The two diagrams which follow show the percentage distribution for the degrees at different concentrations of alcohol in the blood.

Figure I

Figure II

Summary

Surveys made both in 1956 and 1960, which were based on information provided by doctors' reports, showed that 50% of persons examined were considered to be under the influence of alcohol with 0.8 per mille alcohol in the blood (Swedish State Official Report SOU 1963:72, p. 273). According to the present report, 50% of those examined are considered to be under the influence of alcohol with 0.5 per mille alcohol in the blood.

The new type of doctor's report thus provides the possibility of lowering to some extent the value of the concentration of alcohol in the blood at which half of the persons examined were considered to be under the influence of alcohol. However, it must be considered as a very unsatisfactory state of affairs that such a large number of cases were described in the doctors' reports as not being under the influence of alcohol, despite the fact that the concentrations of alcohol in the blood were considerably greater than those values which were determined by quantitative, objective methods as being influenced by alcohol. The reason for this is probably that the consumption of alcohol took place so long before the actual examination was made that the outer symptoms of the effects of alcohol had diminished. The conclusion must therefore be that even the new type of doctor's report on the examination of persons suspected of road traffic sobriety offenses provides sufficient information about the degree of influence.

For practical reasons it is impossible to make the doctor's report more detailed, for instance, by requiring quantitative methods
CHEMICAL TESTS

for the determination of the influence of alcohol for medicolegal use. As not even this would guarantee a correct assessment of the degree of influence on account of the varying individual reactions following the consumption of alcohol, the question may well be put whether the entire matter of a clinical examination of persons suspected of committing road traffic sobriety offenses could be dispensed with, especially as the knowledge of the concentration of the alcohol in the blood provides sufficient information of the deterioration of driving ability which regularly results.

DISCUSSION

Dr. Hansman: This reference to the clinical examination by the doctor, how about the assumption of the police officer as to whether or not the person was under the influence?

Mr. Andréasson: The answer to this question is that Dr. Bjerver, Professor Bonnichsen, and I have done a field study and police officers have given their opinion regarding the degree of influence by alcohol by different persons, but I can say it is worth much more than this made by the doctors.

Dr. Morgan: I would like to ask two questions. You are referring to a form which you have had printed for the doctors to fill in after their clinical examination. Are there any of those forms available for distribution at this meeting?

Mr. Andréasson: I am sorry, no.

Dr. Morgan: In Sweden what is the position if a person refuses to give a sample of blood? What action can you take against him?

Mr. Andréasson: It is compulsory to give a blood test in Sweden and I have not heard of anyone who has refused to do it.

Dr. Morgan: Can I come back to this? Does this mean that you could, in fact, hold the person down on the floor and take a sample from him?

Mr. Andréasson: It is all right.

Dr. Morgan: Has this ever happened?

Mr. Andréasson: I must say that the Swedish people are so kind it isn't done this way.

Question: Does medical examination include any function, coordination, or similar test?

Mr. Andréasson: Yes.

Dr. Walls: Did these statistics you presented take any account of the fact of the man's medical arrest and examination? I assume that in the case of rural districts there is a longer time elapsing from the time of the incident giving rise to the arrest to the medical examination. Is the time between the arrest and the examination always about the same, and if so, how long?

Mr. Andréasson: As I said, it can be the reason for doctors to say that people are not influenced by alcohol because it can be such a long time after they have been arrested until their blood test will be taken that all of the symptoms can disappear.

Dr. Wright: Did the medical examination include a comment as to whether or not the subject's breath smelled of alcohol? It seems rather surprising that people with 150 mg.% or above should apparently have no suggestion at all of influence. I would imagine the doctor who smelled alcoholic breath would be reluctant to say there was no alcoholic influence.

Mr. Andréasson: It is compulsory for the blood test but not breath test. That means the police officer on the road can ask for a breath test and the driver can refuse to give it, but we can take him to a doctor and get a blood sample from him. Also included in this report from the doctors is their opinion from the breath. We find from the police officers that they can only smell the alcohol above one per mille (0.10%).

Dr. Hansman: How were these people, in the first place, taken into custody if neither the police nor the doctor thought they were drunk or under the influence. Why was the investigation begun in the first place?

Mr. Andréasson: You see, the police officer found that the person was influenced by alcohol, therefore, he arrested him and took him to a doctor. After that the other symptoms must have been sufficiently definite for the doctor to find him influenced by alcohol. Does that answer your question?

Question: These included accident cases?

Mr. Andréasson: Accident and not accident.

Dr. Rehling: There was some behavior on the part of the individual that attracted the officer, am I correct in that?

Mr. Andréasson: Yes.

Dr. Rose: Who takes the blood test? That would be one further question, and, then, is it always taken by a doctor? Is the examination done then at the time the blood test is taken?

Mr. Andréasson: All of the blood tests are taken by doctors, and in Sweden we have only one chemical forensic laboratory so all the samples are sent to this institute in Stockholm.