Analgesic Effects of Electroacupuncture in Extracorporeal Shock-Wave Treatment of Gallstone Disease

E. Iliev and S. Deredjan

Summary
Thirty-four patients with gallstone disease were treated with extracorporeal shock-wave lithotripsy (E.S.W.L.). Analgesia was provided by means of electroacupuncture in ear and body acupuncture points. Electrostimulation was begun about 30 minutes before the start of shock-wave lithotripsy and continued until the end of treatment. The number of shock waves varied between 400 and 1200 per patient. The favourable results obtained with the above method may be compared with those obtained with classical epidural anaesthesia as well as with drug premedication with Droperidol, Fentanyl, and Diazepam. The good sedative and analgesic effect which was obtained by acupuncture widens its field of application.

Key words
Analgesia, electroacupuncture, gallstone disease, lithotripsy.

Introduction
Extracorporeal shock-wave lithotripsy was applied to patients with renal calculi in 1981 for the first time by Christian Chaussy and collaborators (1, 2). Four years later in 1985 T. Sauerbruch, G. Paumgartner and collaborators in Grosshadern Hospital in München applied extracorporeal shock-wave for the first time in cases of gallstone disease (6). This method was introduced in the gastroenterology clinic of the Medical Academy, Sofia, from February 1988.

Based on current experience (5), extracorporeal shock-wave lithotripsy is especially successful in cases of a solitary gallstone with cholesterol contents without, or with minimal, calcium deposits. It is known that 90% of concretions contain cholesterol and are X-ray negative. Combined use of lithotripsy with drugs, containing cheno- or ursodeoxycholic acid is a modern alternative to the classic surgical treatment. Standard neuroleptanalgesia for these patients in Bulgaria is achieved with Droperidol, Fentanyl and Diazepam, in combination or alone, in doses according to the individual reaction of each patient. Usually a combined neurolept of 2 ml Droperidol and Fentanyl is given intravenously. If this has no effect the dose is increased to 5 ml. Generally it has been used for patients with a low pain threshold and in cases of prolonged treatment according to time and number of shock-waves.

Experience showed that in cases where the higher dose of neurolept was required, side effects might be seen such as respiratory depression, cardiac dysrhythmias (notably tachycardia, bradycardia and extrasystole) and sharp changes in the blood pressure. Also allergic reactions to some of the drugs have been observed. This encouraged a change to an analgesic method without side effects. Electroacupuncture seemed a possible solution.

Methods
The lithotripsy equipment was the Sonolith 3000 supplied by the firm Technomed International. The capacity of shock waves used for the fragmentation of the gallstones was 12-16 kilovolts. Localisation of stones was under ultrasound control.

This method was applied to 34 patients - 31 women and 3 men aged between 32 and 55 years with single stones (X-ray negative) and good contractility of the gall bladder. The dimensions of the stones were not over 16 mm.

The number of impulses (shock-waves) required varied from 400 to 1200 according to the dimensions of the stones and the success of fragmentation. Analgesia was provided by electroacupuncture stimulation in the following body points: LI4, BL18 and 19, GB34 and LR3, as well as the auricular points: Shen Men, Gall Bladder, Liver, and Subcortex (3).

Electrostimulation was performed with the following parameters:

- Intensity - 50 microampere.
- Voltage - 9 volts.
- Frequency of the impulses - 8-10 Hz for the auricular and distant body points, and 120 Hz for points positioned locally to the gall bladder.

We evaluated the analgesic effect after 50, 200, 400, 600, 800, 1000 and 1200 shock waves by using a "Numerical Rating Scale" of 101 points in which a low value indicates good analgesia (4).

Results and Discussion
The results are given in Table 1. It can be seen that the good analgesic effect (0 to 30 points on the Numerical Rating Scale) varies from 38.2% of patients at 200 shock-waves to 11.1% at 1000 shock-waves. Mild analgesia (31-60 points) is...
TABLE 1.
NUMBERS OF PATIENTS OBTAINING ANALGESIA WITH ELECTROACUPUNCTURE DURING E.S.W.I.

<table>
<thead>
<tr>
<th>Number of Shock Waves</th>
<th>50</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Patients</td>
<td>34</td>
<td>34</td>
<td>32</td>
<td>24</td>
<td>19</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

Good Analgesia
(0-30 points)

<table>
<thead>
<tr>
<th></th>
<th>13</th>
<th>13</th>
<th>10</th>
<th>8</th>
<th>6</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>(38.2%)</td>
<td>38.2%</td>
<td>31.25%</td>
<td>33.3%</td>
<td>31.6%</td>
<td>11.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mild Analgesia
(31-60 points)

<table>
<thead>
<tr>
<th></th>
<th>12</th>
<th>10</th>
<th>8</th>
<th>7</th>
<th>4</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(35.3%)</td>
<td>29.4%</td>
<td>25.0%</td>
<td>29.2%</td>
<td>21%</td>
<td>55.6%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weak Analgesia
(61-80 points)

<table>
<thead>
<tr>
<th></th>
<th>7</th>
<th>9</th>
<th>10</th>
<th>6</th>
<th>5</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>(20.6%)</td>
<td>26.5%</td>
<td>31.25%</td>
<td>25.0%</td>
<td>26.4%</td>
<td>11.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No Effect
(81-100) points

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>2</th>
<th>4</th>
<th>3</th>
<th>4</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.9%)</td>
<td>5.9%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>21%</td>
<td>22.2%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lithotripsy stopped because of pain

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>2</th>
<th>8</th>
<th>6</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(E. Iliev)</td>
<td>Bulgarian Medical Academy</td>
<td>Institute of Dermatology</td>
<td>G. Sofiiski Str., Sofia 1431</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(S. Deredjan)</td>
<td>Bulgarian Medical Academy</td>
<td>Institute of Internal Disease</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References


The BRITISH MEDICAL ACUPUNCTURE SOCIETY
is a society of medically qualified doctors who practise acupuncture or have an interest in it. The society has expanded to include sections for dentists and veterinary surgeons.

The aims of the society are to promote the scientific understanding and practice of acupuncture as part of the normal practice of medicine.

The administrative officer will deal with any enquiries including those regarding membership, courses of tuition, text books, scientific meetings and the Journal of the British Medical Acupuncture Society.

Please send all enquiries to:
THE ADMINISTRATIVE OFFICER, B.M.A.S.
Newton House, Newton Lane, Lower Whitley, Warrington, Cheshire WA4 4JA.
Telephone: 092 573 7227
Analgesic effects of electroacupuncture in extracorporeal shock-wave treatment of gallstone disease
E Iliev and S Deredjan

doi: 10.1136/aim.9.1.23

Updated information and services can be found at:
http://aim.bmj.com/content/9/1/23

**Email alerting service**
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://www.bmj.com/company/products-services/rights-and-licensing/

To order reprints go to:
http://journals.bmj.com/content/subscribers

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/