AMCILLIN IN THE PREVENTION OF POSTEXTRACTION BACTEREMIA

by
Soherwin Mangundjaja
Department of Microbiology, Faculty Dentistry Universitas Indonesia

ABSTRACT
Extraction of a tooth is one of the simplest procedures in dental practice but it may an hazardous effort on the life of patients. Any investigators have demonstrated that transient bacteremia is often caused by tooth extraction and other oral procedures. Bacteremia produced is of a short duration and is not clinically significant. But patients who have a background of sub acute bacterial endocarditis and nephritis, however transient it may be a potentially dangerous position. Amcillin has been used prophylactic and therapeutic to prevent the bacteremia and consequences which follow dental extraction.

Key words: Amcillin – Extraction-Bacteremia

INTRODUCTION

It has been proven that some manipulations in dental treatment, in particular tooth extraction, nearly always produce bacteremia. Now people have become aware of the possible serious situation caused by tooth extraction. Even though bacteremia transient in nature and does not produce symptoms we must be alert to the dangers it may bring about to patients with heart and kidney afflictions. According to literature it has been found not only tooth extraction may results bacteremia, but also other manipulations in dentistry.

Streitfeld and Co-workers (1968) declared that bacteremia could be produced by local anesthetic. The types microorganism which they isolated were Streptococcus spp, Staphylococcus spp, Positive and negative Gram rods.

Commer and co-workers (1968) announced that scaling produced bacteremia of a high percentage and the microorganism which they isolated were Streptococcus viridans and Staphylococcus aureus.

Their finding were confirmed by Yoseph and associates (1969). Irrigation of the gingival sulcus by pressured water with the aim of sterilization prior to an operation, may produced bacteremia.
This matter was investigated by Felix and co-workers (1971) and the microorganism which they were isolated were cocci and negative Gram rods.

Royer and co-workers (1972), Linneerb and co-workers (1974) declared that bacteremia was found after osteoplasty, Flap operation and gingivectomy. The microorganism which were found were *Streptococcus viridans*. Negative Gram Rods, *Diphteroids* and *bacteroids*.

Tooth extraction is always the most in dental clinic as well as in private practice. The microorganism with a high percentage which have been isolated are *Streptococcus viridans*, while *Streptococcus haemolyticus* is also often found.

Sminton (1975), Roger and co-workers (1972), Goldberg and co-workers (1968), Yoseph and co-workers (1969), Elliot and co-workers (1969), Bender and co-workers (1958) declared their findings of *Pseudomonas aeruginosa* in several cases. Here are some figures of bacteremia percentage after tooth extraction performed on Indonesian patients who did not received pre medication. The data were obtain from following sources:

1. Residents of the town of Segalaherang, Subang West of Java, 59 blood samples were examined which 48 blood samples = 81.4% were positive.
2. Employees of the estate XIII Tea plantation Dayeuhmanggung Garut West of Java, 35 blood samples were examined which 31 blood samples 88.6% were positive.
3. Residents of Serpong Tangerang, they came to community Health Center, a rural project of the Universitas Indonesia, 50 blood samples were examined which 45 blood samples = 90.0% were positive.
4. Residents of Jakarta, they came to the Exodontia department of the Faculty Dentistry Universitas Indonesia, 20 blood samples were examined which 18 blood samples = 90.0% were positive.

The relationship between bacteremia and oral foci, dental caries, tooth extraction scaling, gingivectomy, local anesthetic, nephritis and sub acute bacterial endocarditis has become generally accepted.

We want to obtain this research a procedure for preventing the rise of bacteremia with purpose for applying it in the treatment of endocarditis, rheumatic heart fever and nephritis, because these types of diseases prognosis. Literature has medication for tooth manipulations in dentistry.
ANTIBIOTIC THERAPY

DUMEX has made available Amcillin in 250 me capsules as a sample for clinical trials with no commercial value. Amcillin which declared to possessed a broader spectrum than other penicillin and is effective against positive Gram as well as Negative Gram bacteria.

Amcillin in 250 mg, administered per oral, give a high potency in blood after 1-2 effectiveness and absorption into the tissue and 13 not influenced by food and bivalent ions.

In order to obtain an effective of Amcillin several conditions must be fulfill among others:
1. The microorganism which have caused the inflammation must appraised.
2. The microorganism which are often found in the blood.
3. The sensitivity test of microorganism to Amcillin must be determined.
4. Amcillin should be brought to the focus of the inflammation an active potency.
5. Effort should be made to administer Amcillin into blood in high potency.
6. Amcillin should be achieved long enough at the focus inflammation as well as in the blood.

PREVENTION OF BACTEREMIA

Research concerning the prevention of bacteremia was done during the opportunity for social health work of the Faculty Dentistry Universitas Indonesia on July 3 – 17 1978 in Lirik of the Field Oil Stanvac Indonesia Rengat Sumatra Island.

Faculty Dentistry Universitas Indonesia participated in the service of dental health care provided for inhabitants of the District Lirik Field Oil Stanvac Indonesia. The villages where the research was done : Lirik, Air Molek, Lambung Sari and Ukui.
MATERIAL AND METHOD

Basically for the research on bacteremia a perfect disinfectant of the skin is essential. In this way any microorganism which are isolated from the blood, can be interpreted as not having come from polluting bacteria.

This research was done only once by means of drawing blood after the tooth has been extracted, because on account of various technical difficulties.

In the field it is too difficult to work in such way as to be absolutely from polluting, so that we can not obtain a criteria for interpreting, whether the bacteria resulting from the isolation can be considered as coming from bacteremia or whether they are polluting bacteria originating from the skin.

The diagram of prophylaxis, sterilization of the skin and taking of samples which have been performed, are as follow:

1. One or two hours prior to the extraction the patient is given 2 capsules of Amcillin of 250 mg.
2. Then the extraction is performed and its time recorded.
3. The skin area of vena cubiti is cleansed with soap and water with a soft brush. The lather is wiped off in one direction with sterile cotton wool or a sterile gauze.
4. To the skin is applied a betadine solution and covered with a sterile gauze. Then it is left alone for one or two minutes.
5. The blood sample can be drawn about 2-3 cc.
6. Examination for bacteremia is done by direct culture in medium thioglycolate, the volume is approximately 20 times the amount of the blood.
7. The blood sample was recorded as negative if after 4 weeks incubation no visible growth.

After examination of prophylactic bacteremia all the patients are given amcillin 4 x 1 capsule the duration of 3 days.

Table shows the result of prophylactic bacteremia performed on the inhabitants of the district of Lirik of the Field Oil Stanvac Indonesia Rengat Sumatra Island based examination of the 35 patients, the result of the prevention bacteremia shows that only 20% of the blood samples was positive.
RESULTS

Table. Prevention of bacteremia in inhabitants of the field Oil Stanvac
Indonesia Lirik Rengat East of Sumatra Indonesia

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Sex</th>
<th>Age</th>
<th>Diagnosis</th>
<th>Growth in days</th>
<th>Gram Stain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>MH</td>
<td>F</td>
<td>50</td>
<td>/4 RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>DHI</td>
<td>M</td>
<td>30</td>
<td>/67 RG</td>
<td>17</td>
<td>Gram rods +</td>
</tr>
<tr>
<td>3.</td>
<td>GDI</td>
<td>M</td>
<td>47</td>
<td>7/ &amp; 8/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>DWS</td>
<td>M</td>
<td>51</td>
<td>87/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>DWG</td>
<td>M</td>
<td>65</td>
<td>543/3 PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>MDH</td>
<td>F</td>
<td>32</td>
<td>/8 PERIO</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>SRP</td>
<td>M</td>
<td>17</td>
<td>6/6 RG</td>
<td>15</td>
<td>Cocci Gram +</td>
</tr>
<tr>
<td>9.</td>
<td>MRN</td>
<td>M</td>
<td>21</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>JJM</td>
<td>M</td>
<td>15</td>
<td>6/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>ZKI</td>
<td>M</td>
<td>15</td>
<td>6/6 PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>YLA</td>
<td>M</td>
<td>23</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>SNO</td>
<td>M</td>
<td>36</td>
<td>6/ PG</td>
<td>4</td>
<td>Cocci + Gram</td>
</tr>
<tr>
<td>14.</td>
<td>JAT</td>
<td>M</td>
<td>14</td>
<td>6/ PG</td>
<td>19</td>
<td>Rods + Gram</td>
</tr>
<tr>
<td>15.</td>
<td>MHI</td>
<td>M</td>
<td>18</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>16.</td>
<td>IMO</td>
<td>M</td>
<td>22</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>17.</td>
<td>KRI</td>
<td>M</td>
<td>32</td>
<td>1/1 PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>18.</td>
<td>ZLI</td>
<td>F</td>
<td>23</td>
<td>7/7 RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>19.</td>
<td>MGO</td>
<td>M</td>
<td>25</td>
<td>5/67 RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20.</td>
<td>JAI</td>
<td>F</td>
<td>52</td>
<td>63/ PG</td>
<td>5</td>
<td>Cocci + Gram</td>
</tr>
<tr>
<td>21.</td>
<td>YNA</td>
<td>F</td>
<td>21</td>
<td>6/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>22.</td>
<td>AMH</td>
<td>F</td>
<td>22</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>23.</td>
<td>MHN</td>
<td>M</td>
<td>23</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>24.</td>
<td>ZKI</td>
<td>M</td>
<td>23</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>25.</td>
<td>AMN</td>
<td>F</td>
<td>65</td>
<td>765/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>26.</td>
<td>SBO</td>
<td>M</td>
<td>15</td>
<td>6/ PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>27.</td>
<td>ARI</td>
<td>F</td>
<td>26</td>
<td>6/6 PG</td>
<td>5</td>
<td>Rods + Gram</td>
</tr>
<tr>
<td>28.</td>
<td>SMI</td>
<td>M</td>
<td>15</td>
<td>6/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>29.</td>
<td>RAI</td>
<td>F</td>
<td>21</td>
<td>6/6 PG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>30.</td>
<td>ASA</td>
<td>F</td>
<td>28</td>
<td>6/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>31.</td>
<td>RMN</td>
<td>F</td>
<td>65</td>
<td>765/ RG</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>32.</td>
<td>ZRI</td>
<td>M</td>
<td>38</td>
<td>6/8 PG</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

RG : RADIX GANGREN  PG : PULP GANGREN  PERIO : PERIODONTITIS
DISCUSSION.

Oral manipulation procedures produce a condition of bacteremia of a very high percentage, however, even if such the care, it does not attract sufficient attention from the dentist. Bacteremia which arises after tooth extraction may endanger greatly the patients life is stated in literature by the rise of endocarditis is 50 – 4 of which can be ascribed to dental cases.

The bacterial type of *Streptococcus viridans* is the one which is often isolated from blood culture in cases of bacteremia after an extraction.

It is declared in literature that there is a relationship between inflammation of kidneys and dental cases in which is often found *Streptococcus viridans* from the mouth. Prophylactic measures are done to lower the percentage of bacteremia. This matter was examined on the inhabitants Lirik of the Field oil Stanvac Indonesia Rengat Sumatra Island by administering the antibiotic Amcillin. It succeeded in lowering percentage as high as 70%.

The patients were given antibiotic one or two hours before extraction and followed up with 4 x 1 capsule of Amcillin during 3 days.

The application antibiotics one or two hours before tooth extraction is done with the hope of achieving the peak of concentration of the antibiotics in the blood at the moment than the tooth is being extracted.

In facing cases of endocarditis and kidney inflammation it is clear that prophylaxis in very beneficial even if concrete result are not immediately seen.

Cooperation is needed among dentist medical doctor laboratory. The role of the significant in cases mentioned above.

The laboratory submits to the doctors factual reports concerning the types of bacteria and their sensitivity so that the latter can formulated with antibiotics which will more effective.

In connection with bacteremia it is clear that we must make more purposeful efforts while considering the following factors:

2. Hypersensitivity to medication.
3. Complete blood and urine examination.
4. After tooth extraction a blood culture is performed with proper microbiological investigation to the sensitivity of the bacteria.
5. The administration of antibiotics after tooth extraction.
The community we are community which comes to village health centers in which produce bacteremia.

Preventive measures for tooth extraction with potent antibiotics are still difficult to achieve. It is because the antibiotics which can be considered to be potent are rarely found in rural health centers.

The drugs which are usually available there are tetracycline, chloramphenicol and sulfa, but they are also very limited in amount. Their effectiveness is limited too because of high resistance of the bacteria.

We intend do further work to find a good solution for this rural problem.

CONCLUSION.

Bacteremia may be produced by tooth extraction and other oral procedures. For patients with a history of kidney and endocarditis the use of prophylactic antibiotics on tooth extraction is recommended.

Prevention of bacteremia with Amcillin on 35 Inhabitants of the District of Field oil Company Stanvac Indonesia Rengat Sumatra island has succeeded in reducing bacteremia to 20% bacteremia.

REFERENCES


4. GOLBERG, M.H. Gram negative bacteremia after dental extraction J.OraL Surgery 26 : 180-181 March 1968

5. LAZANSKY, JP. ROBINSON. LEONARD. RODOFSKY. LILLIAN,

Factor influencing the incidence of bacteremias following surgical procedures in the oral cavity. *J.Amer, Dent, Ass* Vol 45 June 19-0

7. ROYER, R. GAINES, KRUGER, G. Bacteremia following exodontia, prophylaxis and gingivectomy Dent. Research 43; 877 Sep-Oct 1964

8. STREITFELD , M.M. ZINNER, R.D. Microbiologic hazards of local dental anesthetic J.Amer dent.Aass Accepted for publication.

9. SLAMET DJAIS, SOEHERWIN MANGUNDJAJA. Khasiat Thiampenicol terhadap peradangan dan abses Gigi (Thiamphenicol therapy in dental abscess)

10. SLAMET DJAIS, SOEHERWIN MANGUNDJAJA Penetapan resistensi kuman terhadap antibiotikum (The sensitivity test of microorganism to antibiotics) Presented at First Annual Conference P.T.Bristol Meyers Indonesia Samudra Beach Hotel Pelabuhan Ratu West of Java January 1972

11. SLAMET DJAIS, SOEHERWIN MANGUNDJAJA The evaluation of the combine therapy antibiotic with anti-inflammation agent; in dental infections Presented at the Asian Pacific Dental Congress Jakarta 1974 Hotel Indonesia.

12. SLAMET DJAIS, SOEHERWIN MANGUNDJAJA Antiseptik lokal, Betadine sebagai Bahan antisepsis (Local antiseptic betadine as antiseptic agent) Presented at the Clinical Conference Faculty of Dentistry Universitas Indonesia and Faculty of Dentistry Universitas Trisakti Jakarta March 1975

13. Tasman, S., G, Pressman, R.S. Bender IH. Comparative of Local and Systemic antibiotic therapy in the prevention of post extraction bacteremia J.Amer. dent Ass Vol 57 July 1958

---000---

Paper read at The Asian Pacific Dental Federation Conference IX April 1979 Kuala Lumpur Malaysia.