

Bacteremia After Prophylaxis

II

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MUCH investigative work has established that transient bacteremias are often caused by routine prophylaxis, removal of teeth and other oral procedures which cause bleeding.^{1-29,34,35} Bacteremias thus produced are of short duration and are not clinically significant in most instances. However, in individuals who have a background of acute rheumatic fever, rheumatic heart disease or other valvular heart disease, bacteremias, however transient, are potentially dangerous.^{1,2,7,8,9,13,23,35} This should be taken into account when any periodontal or oral surgical procedure is contemplated.

Rheumatic heart disease is a complication of acute rheumatic fever and is the most common cause of organic heart disease in persons under the age of forty.³⁰ One of the severe complications of rheumatic heart disease is subacute bacterial endocarditis.^{30,38} Before the advent of antibiotics this was almost always fatal. The majority of individuals thus affected now recover, but usually only after prolonged illness.

Approximately 20 per cent of cases of subacute bacterial endocarditis develop within several weeks after dental procedures.^{30,31} This occurs because of the relative frequency of transient bacteremias after prophylaxis, treatment of periodontal disease and other procedures which cause

bleeding. In individuals affected with heart disease bacteria may localize and multiply on deformed or damaged heart valves, resulting in further damage to already involved structures.

Prophylactic use of antibiotics has become standard practice in order to minimize the effects of bacteremias. The use of antibiotics for this purpose and many others has resulted in resistant strains of bacteria, anaphylactoid reactions and deaths, even in patients who have taken the drugs on numerous occasions without undesirable side effects.³⁷ There are instances when this prophylactic use of antibiotics is overlooked because of failure to establish its need. Antibiotics have been administered topically,³⁶ and have been effective in preventing transient bacteremias. Topical use, however, has been shown to cause sensitization and bacterial resistance much more frequently than oral or parenteral administration. Stomatitis venenata is another undesirable side effect of topical use.

A previous study has demonstrated a significant incidence of transient bacteremias following subgingival scaling.³⁵

The present study was undertaken to determine whether the use of local germicidal drugs would prevent or significantly reduce the incidence of bacteremias in such cases. The drug selected was iodine lotion, which consists of:

phenol 5%—1 part
tincture of aconite—2 parts
(by volume) tincture of iodine 3½%—
3 parts
glycerin—4 parts

The selection of iodine lotion was made for several reasons. This is a drug used for a long period of time on an empirical basis

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during scaling and curetting procedures and is part of the armamentarium used in many dental offices. Iodine used alone would pose the possibility of burns. Iodine lotion seemed to be a combination which would exert a destructive effect on the bacterial content of periodontal pockets without undue reaction on the part of the tissues involved.

The pharmacology of the ingredients of iodine lotion is as follows:

- phenol 5%—antiseptic, disinfectant, germicide, anesthetic
- tincture of aconite—anodyne, analgesic
- tincture of iodine 3½%—antiseptic, germicide
- glycerin—demulcent, solvent

Since the previous study has shown that the incidence of bacteremia following subgingival scaling in the presence of gingivitis was not statistically significant,³⁵ the investigation being reported was limited to cases exhibiting signs and symptoms of periodontitis. As in the previous study patients were selected and divided into two groups, periodontitis grade I and periodontitis grade II. The selection and classification was determined on the basis of the following criteria: abnormal changes in color, form, density and attachment of gingival tissues;³² discharge of serum or pus, hemorrhage, discomfort or pain, hypermobility of teeth and/or loss of alveolar bone and process. When these changes included the presence of periodontal pockets cases were diagnosed as periodontitis and were graded I or II according to the following changes: 1. clinical hypermobility of grade I or more,³⁹ 2. periodontal pockets of more than 3 m.m. of depth, 3. bifurcation and/or trifurcation involvements, and 4. loss of alveolar bone and process. The occurrence of at least two of these criteria, with pocket formation, indicated periodontitis grade II, whereas a less severe condition indicated periodontitis grade I.

The experimental procedure employed followed that of the previous study,³⁵ except for the use of iodine lotion in the

involved areas before scaling and curetting procedures. After thorough preparation of skin, a 10 c.c. sample of blood was drawn from the patient's antecubital vein both before and after the dental procedure. The blood was cultured on tryptase phosphate broth aerobically and anaerobically and subcultured at intervals of 48 hours, 72 hours and two weeks before a result was issued. The dental procedure consisted of routine calculus removal, curettement of crevicular epithelium and root planing. Before the procedure, the area used was isolated by cotton rolls and iodine lotion was instilled into the periodontal pockets by means of a blunt-tipped needle. The drug was allowed to remain for 5 minutes, after which the scaling and other procedures were performed for exactly two minutes and the second sample taken immediately on completion of the procedure. It was decided to limit the procedure to two minutes⁶ because bacteremias are often of short duration and it was felt that a longer period of time might result in missing positive findings.³³

32 cases consisting of 13 cases of periodontitis grade I and 19 cases of periodontitis grade II were done in this manner. In sharp contrast to the findings in the first study no growth was obtained in any case.

<i>Group</i>	<i>No. cases</i>	<i>Pre-treatment</i>	<i>Post-treatment</i>
Periodontitis Grade I	13	0	0
Periodontitis Grade II	19	0	0

Without the use of iodine lotion the incidence of bacteremia following scaling procedures was 22% in periodontitis grade I and 42% in periodontitis grade II. The predominant organisms recovered in the first study were *Strep. viridans* and *staph. aureus*.³⁵ It should be noted that positive findings were obtained in the pre-treatment samples in 5 cases in the first study, and none in the second. This is probably accounted for by the fact that in the second

study a closed bottle method was used in drawing blood and reduced the possibility of contamination. There is also the possibility that bacteria were present in the peripheral blood at the time the first sample was obtained.

A study by Bervell⁴⁰ recently reported seems to substantiate the findings of this investigation. His work consisted of the use of an iodine resin varnish in healthy gingival crevices. No bacterial growth was obtained in 60 cases as compared with 57 positive findings without the application of iodine.

The statistical results of the two studies, Bacteremia after Prophylaxis I and II, support the conclusion that where periodontitis exists there is an increased risk of bacteremia as a result of dental procedures. The importance of careful history taking to determine the presence or past occurrence of rheumatic fever, rheumatic heart

disease or other valvular heart disease is pointed out. In individuals reporting such a background, aseptic precautions are important. This study indicates that the topical use of germicidal drugs is of value in eliminating or perceptibly reducing the incidence of bacteremias following scaling and curetting procedures. The routine use of such drugs appears to be of value. Further work would be helpful in establishing whether topical use of such drugs can be depended upon to eliminate the production of bacteremias following scaling and surgical procedures. Until this has been demonstrated to be entirely dependable, prophylactic use of antibiotics should not be abandoned. The topical use of iodine lotion routinely seems to be of value in all situations. Its use in conjunction with antibiotic therapy where there is a concern about the effects of transient bacteremias is also indicated.

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