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Discussion - The Immunology of Dental Caries

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Summary

1. Dental caries has a complex etiology with the following predisposing factors: (1) Age; (2) Oral Hygiene; (3) Diet; (4) General Health; (5) Heredity. The exciting factor is an aciduric organism—*Bacillus Acidophilus*.
2. Correlation exists between the skin reaction to polyvalent filtrate injections and dental caries susceptibility.
3. Use of vaccines of the rough and mixed phases of *Bacillus Acidophilus* is followed by abscess formation.
4. Smooth phase vaccine is not followed by abscess formation.
5. Increases in the agglutinin titer were noted in the patients following use of vaccines of the rough phase.
6. No increase in the agglutinin titer was noted following use of vaccine of the smooth strain of *Bacillus Acidophilus*.
7. Causative agent of the abscess formation is not known.

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Discussion—By Ruth E. Moore, Ph.D.

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IN THIS paper on the immunology of dental caries, a number of facts should be mentioned which are of importance from an immunological as well as bacteriological standpoint; namely, etiological

agent, immune bodies or antibodies, skin testing, and the possibility of vaccine therapy.

The etiological agent has been grouped under two headings: those of the exciting or instigating and the predisposing factors. The most important of the predisposing factors is that of diet; while the exciting or instigating factor is now known as *Bacillus Acidophilus*. This organism has fulfilled the first two rules of Koch's postulates, but the third and fourth rules of the postulate have been demonstrated in vitro. *Bacillus Acidophilus* being an aciduric organism utilizes the carbohydrates present, especially in those on a high carbohydrate diet; thus producing an ideal condition for the organism's growth and the activity of the carious process. This is well illustrated by a number of workers.

As *Bacillus Acidophilus* is present constantly in the mouths of all caries susceptible patients, and its absence is noted in the mouths of caries-free patients, the question arises as to whether some substance is present in the saliva which may act as a bacteriocidal agent, and thus destroy the organism. It would be extremely interesting if antibodies for *Bacillus Acidophilus* could be demonstrated in the saliva, particularly in those termed caries-free individuals.

In regards to skin reaction, a word should be said concerning the filtrate. As this reaction is not similar to that in the Dick and Schick Test that of a toxin, and since no toxin has been demonstrated for *Bacillus Acidophilus*, some other explanation must be offered for this reaction—that of bacterial allergy.

In Tables 1 and 2, showing the skin reactions with the purified and unpurified filtrate, one or two points are of interest. There is disagreement in the skin reaction with both the purified and unpurified filtrate. It would also be of interest to note the skin reactivity of caries free individuals with both the purified and unpurified filtrate. Is it possible that this irregularity of the skin reaction is due to a pooled filtrate and could this irregularity be eliminated through the use of R or S filtrate?

If the purified filtrate resembles a carbohydrate and contains no antigenic factor, but only the skin reactive substance, this filtrate would be designated as a haptene in that it does not stimulate the production of agglutinins.

From the experiments on vaccine in children, the abscesses produced at the site of inoculation with the R and mixed phase of *Bacillus Acidophilus*, cannot wholly be due to the phenol in that phenol was present in the S vaccine, and it should also be present

in the sterile broth culture, which was used as a control. Thus this condition must be due to some other factor other than the phenol.

Some progress has been made in the bacteriology of dental caries, as to the etiological agent; however, as to the immunology of the subject, more work should be done on the susceptibility test, immunization, and the possibility of vaccine therapy.

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Your colleagues will be at the N. D. A. Convention a thousand strong. Meet them there.