A Study On Quantitative Determination Of Salivary Immunoglobulins

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Introduction

There are many studies on the structure and function of human serum immunoglobulins. Considerable interest has recently arisen concerning the immunoglobulins of various body fluids (saliva, cerebrospinal fluid, tears, colostrum). Tomasi and Zigelbaum (13) first showed that the relations of three major immunoglobuling (IgA, IgG, IgM) in parotid fluid, colostrum, lacrimal fluid were quite different from the relative amounts of these proteins in serum.

Although IgA comprised about 15 per cent of the serum immunoglobulins, it was virtually the major immunoglobulin found in these fluids (5, 6, 11). Differences in structure were also apperent. Most of the colostral and parotid gA were found to have a sedimenetion coefficient of 11S, while serum IgA circulated primarily in the 7S state (14). This difference in size was found to be associated with «secretory piece» (4, 15).

Measurements of salivary immunoglobulin concentrations have been hamprede by the very low levels of these proteins in native

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saliva. Ordinary methods of immunoglobulin quantition require collection of large volumes of saliva and subsequent procedures. The development of new techniques have permitted simple and rapid quantition of immunoglobulins in saliva.

The purpose of this report is to quantitate immunoglobulin levels in whole saliva and to compere the values obtained by different techniques.

Materials and Method

Whkole salivas from randomly seleceted 52 individuals were collected in tubes directly without any stimulation (5 ml). Each tube of saliva was stoppered with plasticine and centrifuged to spin down other particules and heavy mucus.

Immunoglobulins (IgA, gG, IgM) were measured in saliva by the method of multiple radial immunodiffusion (MRD), as Doman (8) described. The principle of method depends on mixing the saliva with agar gel during the test and pouring it on to a plate of standard size (70 mm X 80mm) and antisera are placed in circular rezervoirs. On the same plate three of immunoglobulin can be determined as there are monospesific antisera avaliable. The calibration curves are made by means of standard antigen solutions.

Results

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The higher and lover quantitative detection of IgA, IgG, IgM are shown in Table I.

	Subject	Minimum	Maximum	Mean	SD
IgA	52	1,35	30	16,24	10,96
IgG	41	0,6	25	6,80	6,99
IgM	11	0,8	10,5	4,92	2,52

Table I — Salivary immunoglobulin levels in whole saliva (%mg).

Discussion

In recent years the work of Brandtzaeg (3(has helped to clarify the source of Ig's. Serum proteins are present in the connective tissue ground substance of salivary glands. In the gingiva IgG is the dominating Ig in contrast to the crevicular epithelium, secretory epithelium and ducts which normally are relatively impermeable to IgG. This globulin is therefore a minor companent in the pure glandular secretion. The major globulin IgA is produced by a selective

mechanism IgM is also selectively transported through secretory epithelia.

Quantition of whole saliva posess additional problems. First the contribitions to this fluid from the minor, submandibular and parotid glands vary greatly according to the flow rate of whole saliva, secondly the flow rate can not be so accurrately measured as t he parotid secretion, thirdly the fluid has to be cleared by centrifugation before quantition. Despite these disadvantages, whole saliva is commonly used as a representative external secretion because it is easily obtained (7). To increase its volume, chewing of parafin, gum, lemon juice have been used. But in our study non of these were used. Because to use stimulation for collecting of the saliva is the other subjects of discussion. Mor e over storage of saliva for a long time at —20 C reduces measurable Ig concentrations (1).

In the research of LoGrippo, Hayashi, Perry (10), the range of IgA in unstimulated whole saliva was, 0,01-2,2 %mg, m; 1,15±SD2 %mg, the range of IgG was, 0-1, 19 % mg, m; 0,83 ± SD %mg.

In the same year (1969 Lehner (9) pointed out the mean of IgA values in 30 unstimulated total saliva was about 12 %mg.

According to the Brandtzaeg (2) in 11 salivary samples range of IgA was, 14,2-29,3 %mg, m; 20,7 %mg.

In 1974 DiCarlo and Tringali (6) performed the similar study on the 9 unstimulated whole saliva. The values of the IgA were, range; 1,40-5 % mg, m; 3,3 %mg, the IgG values were range; 0,20-1,5 %mg, m; 0,74 %mg.

Mach and his co-workers (11) had a study in 1976 on the various type of diseased and normal individuals. Their study shows that in whole saliva immunoglobulin quantities can have great differances (range of IgA; 4-205 %mg, range of IgG; m,5-120 %mg, range of IgM; 6-50 %mg).

Stelzer et al (12) pointed out the range of IgA on 300 salivary samples; 8,2-29 %mg.

All these workers have employed different techniques, used different amount of samples and have obtained different results. There is some disperity between our values and the values obtained by other workers. In the light of all these findings it can be accepted

that immunoglobulin values in whole saliva shows great variablity. This variablity depends on the kind of quantitative determination methods, envoirmental conditions, the age, sex, digestion, stimulation, the charecter of the body's host defence mechanisms, various diseases and the most important of all, the spesific characteristics of the population. If all these factors could be controlled, it would be useful to determine the differances of the Ig quantities for different populations. A knowledge of the normal values in a population would help clarify the salivary immunoglobulins in various diseases.

SUMMARY

In this repport salivary immunoglobulin levels were quantitated by the multiple radial diffusion technique (MRD) and these values were compered with the other values which were obtained by other techniques.

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