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## Comparative Evaluation of Salivary Total Protein Concentration in Male and Female Children in Permanent Dentition Age Group.

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### ABSTRACT

Saliva – the esoteric body fluid has total proteins, electrolytes etc., of clinical relevance that are present in blood and urine. These indicators in saliva can help in diagnosis, progression of disease status. Hurdle to this saliva– diagnostic tool is the lack of baseline values in reference to age, gender etc., In this study, saliva in permanent dentition age group of male and female is evaluated as there are very few studies done. To evaluate and compare salivary total proteins in male and female children in permanent dentition age group. Unstimulated whole saliva samples were collected from 5 normal healthy male children and 5 normal healthy female children ranging from above 14 to 19 years old. Diluted saliva sample were then subjected to inductively coupled plasma emission spectroscopy. Results were tabulated and statistically analyzed using Mann Whitney 'U' test. In this study, salivary total protein concentration was higher in females compared to males and showed statistical difference. This study lays a foothold and may serve as a reference value for growing interest in saliva as a diagnostic tool.

**Keywords:** saliva, total protein, dentition

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## INTRODUCTION

Saliva the miraculous body fluid contains various indicators like total proteins, electrolytes, hormones, enzymes etc. The newer sophisticated technique like spectroscopy accelerates in discovery of total protein and electrolytes and their application to saliva promises to extend the scope of oral diagnostics to the study of systemic disease as well as oral disease and metabolism. In a proteomic study carried out by Panvalkar et al, salivary total proteins showed age related increase in salivary total protein from deciduous to mixed to permanent dentition age group.[1] In previous articles we found remarkable variations in salivary electrolytes in mixed and permanent dentition in females compared to males.[2,3] This change can be related to hormonal influence of puberty. Thus, the aim of this study is to evaluate and compare salivary total protein concentration in male and female in permanent dentition age group.

## MATERIAL AND METHODS

### Criteria for patient selection

In the present study, 10 normal healthy children ranging from 14 to 19 years were selected from housing societies in and around Pimpri-Chinchwad area of Pune district who were free from any systemic or local diseases, which affect salivary secretions and totally caries free with dmft/DMFT score of 0 [4] in 2015. After assessing and confirming their caries status these children were stratified equally into two groups: 5 male children (ranging from 14 to 19 years), 5 female children (ranging from 14 to 19 years). Exclusion criteria included patients who were physically or mentally compromised, having developmental delay, auditory or visual dysfunction, known neurological diseases, history of drug intake and patients with arrested carious lesions [5]. Informed consent forms were obtained from the custodial parent or guardian of the subject after explaining the procedure to the parent or guardian.

### Method of saliva collection

To minimize the effect of circadian rhythms, all whole saliva samples were collected one hour after lunch for the unstimulated condition [6]. The child was seated in a well-ventilated and well-lit room. The head was kept at 45 degrees flexion with one hand holding onto a 4ml cryo-precipitation vial with a funnel inserted into it, in a calm atmosphere to simulate un-stimulated conditions. The saliva was allowed to drip into the funnel held to the lower lip. For each trial, the collection continued for 2 minutes but if the saliva sample was insufficient within 2 minutes, the collection was continued until 2 ml of saliva per subject was obtained [5].

### Methods of laboratory analysis

For detection of total proteins in saliva, the saliva samples obtained from each subject were diluted with distilled water in a proportion of 1:4. This diluted saliva sample was then subjected to inductively coupled plasma emission spectroscopy for detection of total proteins, light chromatography coupled with mass spectrometry (LCMS) was used. Mass spectrometry (MS) is an analytical technique used for determining masses of particles, for determining the elemental composition of a sample or molecule and for elucidating the chemical structures of molecules, such as peptides and other chemical compounds.

## RESULTS

Results were tabulated and statistically analyzed using Mann Whitney 'U' Test. Results are statistically significant.

**Table 1: Salivary Total protein concentration (mg/dl) in male and female permanent dentition**

	Male	Female
Sample 1	21.4	50
Sample 2	20.2	33.5
Sample 3	21.4	51
Sample 4	26.3	78.06
Sample 5	22.1	44

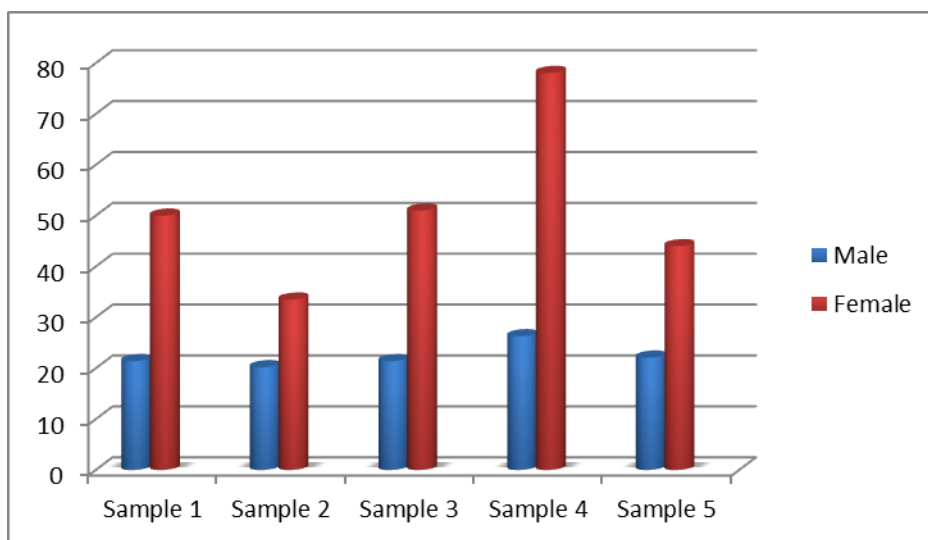
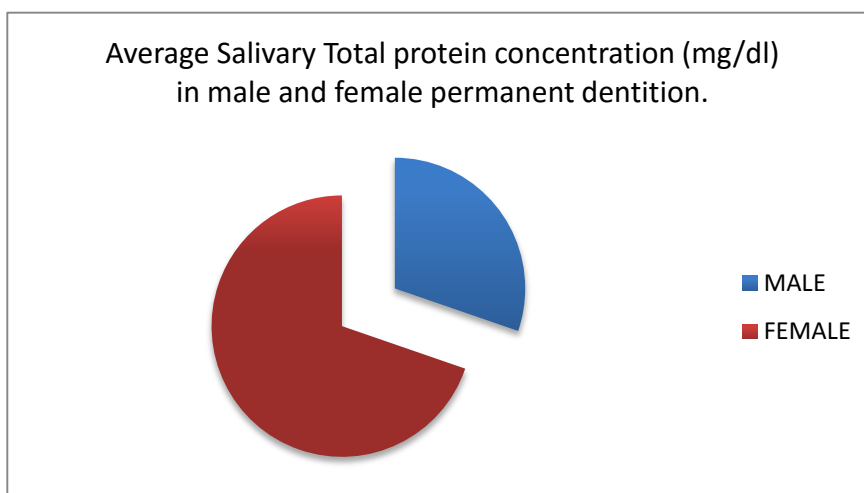


Figure 1: Salivary Total protein concentration (mg/dl) in male and female permanent dentition.



### DISCUSSION

Total proteins in saliva may have both protective and detrimental properties.[8] Salivary total protein play a important role in the overall maintenance of a healthy homeostatic condition in the oral cavity, which from the dental perspective usually is considered to be related to protection of the teeth and mucosal surfaces.

In this study, salivary total protein concentration was found higher in female than in male group. Results showed statistical significance.

The cyclic hormonal changes can affect a variety of physiological and biochemical processes. The present investigation revealed that salivary total protein considerably varied depending upon the pubertal status of women. During past several years there has been increased interest in the study of relationship between the essential proteins and ovarian hormones activity. In a study carried out by Ahmadi-Motamayel et al found that salivary total protein level were higher in the boys' than in the girls' of caries free group and the difference between the two genders was statistically significant.[9] In a study, carried out by Rahul R. Deshpande et al demonstrated higher levels of total proteins in patients with the cleft lip and palate defect than healthy children.[10] A change in the hormonal level in pubescence may also be strong enough to cause changes in the salivary composition.[7]Salivary electrolytes can also be used to identify milestones in females due to hormonal influence.[2]



## CONCLUSION

Analysis of saliva may provide a cost-effective approach for the screening of large populations for saliva to play a role as a diagnostic aid it is necessary to examine the consequences of pre analytical physiologic variations with respect to age and sex as the physiologic levels of different analysis in blood are established as a function of age before it can be used in detection of pathologies. Since, several factors can influence salivary secretion and composition there is a necessity of precise pre-analytical range of salivary total proteins in permanent dentition age group in male & female children. Thus, this study is a torchbearer and helps forming preanalytical and physiologic range of salivary total protein in future studies.

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