STUDY OF SALIVARY INORGANIC ELEMENTS IN RELATION TO DENTAL CARIES IN A GROUP OF MALAYSIAN PRIMARY SCHOOL CHILDREN IN SHAH ALAM

HALA FATHALLAH ALI BEN GHASHEER

Thesis submitted in fulfillment of the requirements for the degree of Master of Dental Science

Faculty of Dentistry

January 2013
<table>
<thead>
<tr>
<th>Perpustakaan Tun Abdul Razak UTM Shah Alam</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Perolehan</td>
</tr>
<tr>
<td>Control Number</td>
</tr>
<tr>
<td>Tarikh</td>
</tr>
<tr>
<td>No Aksesan</td>
</tr>
</tbody>
</table>
AUTHOR’S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledgment as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulation for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student : Hala Fathallah Ali Ben Ghasheer

Student I.D. NO. : 2009553651

Program : Master of Science in Dentistry

Faculty : Dentistry

Thesis Title : Study of Salivary Inorganic Elements in Relation to Dental Caries in a Group of Malaysian Primary School Children in Shah Alam.

Signature of Student : ...........................................................

Date : January 2013
ABSTRACT

Introduction: Dental caries is one of the most common dental diseases. It is a competition between the pathologic factors such as bacteria and carbohydrates and the protective factors such as saliva. Saliva refers to the fluid that surrounds oral tissues and maintains normal physiologic functions. Previous studies had shown that inorganic constituents of saliva played an essential role in the caries process. Objectives: To determine and compare the concentration of salivary inorganic elements namely, Sodium (Na), Potassium (K), Copper (Cu), Zinc (Zn), Manganese (Mn) and Iron (Fe) and assess their possible relationship with caries in unstimulated saliva obtained from Malaysian school children aged 8-12 years old in Shah Alam. Methods: 120 primary school children were included; caries status of each child was scored. Five ml of unstimulated whole saliva was obtained. Saliva samples subjected to analysis of elements concentrations using Atomic Absorption Spectrophotometer. Results: Na, K, Cu and Zn mean levels in caries free group were 16.88±8.20 ppm, 21.57±11.29 ppm, 0.12±0.06 ppm and 0.09±0.05 ppm, respectively. While in caries group the mean levels were 40.41±20.66 ppm, 30.39±13.53 ppm, 0.29±0.08 ppm and 0.14±0.10 ppm, respectively. Mn and Fe levels did not show any significant variation. All the investigated elements showed highly significant variations when compared among Malays, Indians and Chinese groups. A statistically significant difference was observed between different age groups. No sex based difference was found. Conclusions: Na, Cu and Zn levels in saliva were significantly lower in caries free group, K level in saliva was significantly higher in caries free group. A statistically significant positive correlation was recorded between salivary Na, Cu and Zn levels and dental caries, while a negative correlation was found between salivary K and dental caries, thus suggesting the possibility of their effect and potentiality in modifying the dental caries.
ACKNOWLEDGEMENTS

First and foremost, I would like to express my appreciation to Dr. Alaa, who has shown a large and consistent support during the times. Her guidance, encouragement and her many constructive comments have greatly improved my thesis. Thank you for everything through all hard times.

I am also exceedingly grateful to Prof. Mohamed Ibrahim, for his invaluable support, in spite of having practically no spare time, still managed to find time to provide help and advice.

My thanks must also go to Dr. Tan Chee Hian (PhD, FSR), for his priceless help to get permission from the Chinese school, without him, my study would not be finished.

Also, special thanks to UiTM dental faculty’s nursing staff & drivers for their assistance in each school visit, you made this study happen.

I would like to acknowledge the primary schools in Shah Alam for making this study possible by participating. SJK (T) Ldg Glenmarie, SJK (T) Hicom, SJK(C) Pin Hwa and (SJK) Padang Jawa.

The most special thanks go to my parents, without whom I would never been able to achieve so much. Thanks for your faith in me.

I have to specially mention my long standing friends, my siblings. Together we proved that long distance cannot be an obstacle for effective support.

Last but not least, I wish to express my love for the only one who knows the real price of this thesis as we suffered and paid it together. Ahmed, you always told me that “We should never surrender”. Without your love, patience and understanding I would not be able to make it. My little angels Fatima Al Zahra’a & Salah. You are the joy of my life. Whenever I’m depressed, I look into your eyes, it just takes few minutes to realize that “Nothing is impossible”. Thank you for inspiring me.

Alhamdulillah for giving me faith, strength and health to finish my thesis