ASSOCIATION OF DNA REPAIR GENE POLYMORPHISM (XRCC1) AND ORAL CANCER RISK

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ABSTRACT

The main aim of the present study was to determine the distribution of XRCC1 Arg399Gln genotypes in oral cancer and non-oral cancer patients. This study was also to investigate the association between XRCC1 Arg399Gln genotypes and oral cancer risk and to compare the distribution of XRCC1 Arg399Gln genotypes among different ethnic groups in Malaysia.

This case-control study involved a total of 209 cases of oral squamous cell carcinoma (OSCC) patients and 212 controls with neither any trace of cancers nor any family history of cancer. Mean age of the OSCC patients for cases was 61.34 ± 14.01 years, while for the control the mean age was 45.56 ± 12 years. About 62.07% (131) and 37.03% (78) were females and males respectively for cases and 54.02% (115) and 45.08% (97) females and males respectively for controls. Determination of XRCC1 Arg399Gln genotypes was done using genomic DNA from blood samples. The final genotypes were determined using PCR and PCR-RFLP where 3 genotypes were recognized; namely the normal/wild-type (Arg/Arg), the 2 polymorphic genotypes namely the heterozygote (Arg/Gln) and the homozygote (Gln/Gln).

The results revealed that the distribution of XRCC1 Arg399Gln polymorphism (Arg/Gln; Gln/Gln) was 65.1% for cases and 58.5% for controls. When the polymorphisms were considered separately, the distribution of Arg/Gln among the cases was 48.8% and among controls was 41%. The distribution of Gln/Gln among cases and controls were almost similar which is 16.3% and 17.5% respectively.

The Chi square test revealed either individually or in combination that there was no significant association between XRCC1 Arg399Gln genotypes and oral cancer risk.
Similarly, there was no significant difference in the distribution of XRCC1 Arg399Gln genotypes when analyzed either individually ($p=0.617$) or in combination ($p=0.641$) between three different ethnic groups.

In conclusion, there was a higher distribution of XRCC1 Arg399Gln polymorphism in cases as compared to control. There was no association between XRCC1 polymorphism and oral cancer risk and there was no significant difference observed in XRCC1 genotype distribution in the different ethnic groups.
ACKNOWLEDGMENT

First and foremost, I would like to thank God for his blessing and faithfulness. He is my constant companion through all my life.

I would like to dedicate this thesis to my dear mother and father for their endless support and encouragement in all aspects of my life. I owe whatever I have to you and this thesis may probably be more valuable to you than to me but your endless love and spirituality is the gist that makes it incredibly invaluable.

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<tbody>
<tr>
<td>ADH</td>
<td>Alcohol Dehydrogenase</td>
</tr>
<tr>
<td>Bp</td>
<td>base pair</td>
</tr>
<tr>
<td>CARIF</td>
<td>Cancer Research Initiatives Foundation</td>
</tr>
<tr>
<td>DNA</td>
<td>Deoxyribonucleotide acid</td>
</tr>
<tr>
<td>dNTPs</td>
<td>deoxyribonucleotide triphosphate</td>
</tr>
<tr>
<td>EDTA</td>
<td>Ethylene Diamine Tetraacetic Acid</td>
</tr>
<tr>
<td>GCF</td>
<td>Gingival Crevicular Fluid</td>
</tr>
<tr>
<td>GST</td>
<td>Glucathione S Transferase</td>
</tr>
<tr>
<td>MgCl</td>
<td>Magnesium Chloride</td>
</tr>
<tr>
<td>mL</td>
<td>milliliter</td>
</tr>
<tr>
<td>mM</td>
<td>milliMolar</td>
</tr>
<tr>
<td>NO</td>
<td>Nitric Oxide</td>
</tr>
<tr>
<td>OCRCC</td>
<td>Oral Cancer Research and Coordinating Center</td>
</tr>
<tr>
<td>OSCC</td>
<td>Oral Squamous Cell Carcinoma</td>
</tr>
<tr>
<td>OR</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>PCR</td>
<td>Polymerase Chain Reaction</td>
</tr>
<tr>
<td>RFLP</td>
<td>Restriction Fragment Length Polymorphism</td>
</tr>
<tr>
<td>ROS</td>
<td>Reactive Oxygen Species</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>PASW</td>
<td>Predictive Analysis Software</td>
</tr>
<tr>
<td>SCC</td>
<td>Squamous Cell Carcinoma</td>
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XRCC1 : X-ray Cross Complementing Group 1 Protein
RE : Restriction Enzyme
Msp1 : Restriction Enzyme obtained from Bacteria
AE : Isolating Elution Buffer
TBE : Mixture of Tris base, Boric acid and EDTA