

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.

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LIST OF ABBREVIATIONS

ADH	: Alcohol Dehydrogenase
Bp	: base pair
CARIF	: Cancer Research Initiatives Foundation
DNA	: Deoxyribonucleotide acid
dNTPs	: deoxyribonucleotide triphosphate
EDTA	: Ethylene Diamine Tetraacetic Acid
GCF	: Gingival Crevicular Fluid
GST	: Glucathione S Transferase
MgCl	: Magnesium Chloride
mL	: milliliter
mM	: milliMolar
NO	: Nitric Oxide
OCRCC	: Oral Cancer Research and Coordinating Center
OSCC	: Oral Squamous Cell Carcinoma
OR	: Odds Ratio
PCR	: Polymerase Chain Reaction
RFLP	: Restriction Fragment Length Polymorphism
ROS	: Reactive Oxygen Species
WHO	: World Health Organization
PASW	: Predictive Analysis Software
SCC	: Squamous Cell Carcinoma

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