**RUNX2 Single nucleotide polymorphism (rs6930053) in Class II malocclusion patients: A preliminary study**

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**Abstract**

Runx-related transcription factor 2 (RUNX2) plays important roles in osteoblast differentiation, tooth development and chondrocyte maturation; hence its involvement in craniofacial development is paramount. Mutation in RUNX2 is implicated with cleidocranial dysplasia; a bone development disorder, while single nucleotide polymorphism (SNP) in RUNX2 is associated with Class II/D2 malocclusion. Although genetic factor has been associated with the incidence of malocclusion; very limited study was conducted to determine the association of certain genes with the incidence of malocclusion in Malaysia. Thus, this preliminary study aimed to determine the presence and association of RUNX2 SNP (rs6930053) in Class II malocclusion patients. Genomic DNA was extracted from unstimulated saliva of 31 Class I (control samples) and 30 Class II malocclusion patients. Cephalometric measurements were performed prior to saliva samples collection. The DNA was amplified using the specific primers for marker rs6930053 and the genotyping was done by sequencing. Chi-square test was used to determine differences in allele and genotype frequencies. Significant difference was detected in allele (p=3.04X10^-6) and genotype (p=4.06X10^-6) frequencies between control (Class I) and Class II malocclusion. This result suggested there was a genetic association between RUNX2 (rs6930053) with Class II malocclusion (p=3.04X10^-6, OR= 6.59; 95% CI=2.88~15.08). We provided preliminary observation that RUNX2 SNP (rs6930053) might contribute to Class II malocclusion in our local population. Further studies involving larger number of samples and other DNA markers of RUNX2 gene should be developed in order to understand the exact role and mechanism of RUNX2 in different classes of malocclusions and how this polymorphism affects the malocclusion cases in Malaysian population.

**Keywords:** Class II malocclusion; rs6930053; SNP; RUNX2

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