

Investigation of the Chromosome 6 Instability and the MAPK Signaling Pathways in Human Osteosarcoma

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Abstract

Osteosarcoma is the most common primary malignancy of bone with worldwide incidence of 2 to 3 million/year. This tumour usually develop at distal part of fast growing bone and associated with instability of chromosome 6. Despite that, the preceding molecular mechanism leading to the instability is not fully known. Following the local ethical committee review, from a total of 30cases within 7years period (from October 2008 to October 2015). The study aimed to investigate the copy number of gene encoding vascular endothelial growth factor (VEGF) located at chromosome 6p21 using *Fluorescence In Situ Hybridization* (FISH) and the general chromosomal instability as indicated by micronuclei formation. In addition VEGF, Hypoxia inducible factor (HIF) and p53 diagnostic immunohistochemistry (IHC) staining were performed as to investigate relationship of hypoxic stress and tumour growth suppress. Furthermore, the mitogen activated protein kinase (MAPK) cellular proliferation pathway molecules; ERK, p38 and JNK IHC were also examined. Our findings showed VEGF expression at both protein and gene level (6p21) indicating likelihood of neovascularization. On top of that, expressed ERK, p38 but not JNK; and expressed HIF & p53 in those cases suggest tumour cell survival by evading the natural cell death program, apoptosis. In conclusion, this study presented a possible molecular mechanism underlying chromosomal instability in human osteosarcoma.

Keywords: Osteosarcoma; mitogen activated protein kinase; chromosomal instability; 6p21

Presentation Theme (Tick one ✓):

- Haematology & Transfusion Science [HT]
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 Communicable Diseases (includes; Microbiology/ Parasitology & Epidemiology) [CD]
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