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Full Length Research Paper

The role of myeloid derived suppressor cells and CXCR4 genes expression for nasopharyngeal carcinoma progression

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Nasopharyngeal carcinoma (NPC) is radiosensitive, but prognosis remains poor with a 5-year survival around 50% due to secondary spread of tumor cells. Tumors growth is influenced by many factors, generally an interaction between genetic and environmental factors, particularly the microenvironment tumor. There is the role of myeloid derived suppressor cells (MDSC) in the process of tumors growth. MDSC are immature myeloid cells produced by bone marrow precursor cells that are increased in a variety of disease. Most significantly, MDSC are increased in cancer patients and significantly contribute to the immunosuppression. MDSC are then recruited to the tumor by such chemotactic factors as tumor derived CXCL12 and stem cell factor that bind to and active their respective receptors CXCR4 on MDSC. The main role of MDSC appeared to be due to immunosuppression of anti-tumor effectors and had significant effects of tumor progression. This study identified specific markers that can be used to identify MDSC and the relation with CXCR4 for NPC progressivity prediction. Peripheral blood specimen and biopsy from primary tumor were collected from 16 nasopharyngeal carcinoma patients. The samples collected underwent qRT-PCR. Data were analyzed by $2^{-\Delta\Delta Ct}$ methods and statistical analysis. CD14, CD15, and CXCR4 genes are expressed in peripheral blood and primary nasopharyngeal carcinoma. We found that patients with advanced stage had elevated number of circulating CD14, CD15, and CXCR4 although the increase of CXCR4 did not reach the significant level. MDSC and CXCR4 correlated significantly with T and N classification and clinical stage also. We concluded that expression of MDSC and CXCR4 play an important role in tumor progression and invasion in NPC.

Key words: Nasopharyngeal carcinoma, qRT-PCR, MDSC, CXCR4, clinical stage.

INTRODUCTION

In Indonesia, nasopharyngeal carcinoma (NPC) is a frequent cancer, rating as the fourth for all malignancy and the most common malignancy in the head and neck. NPC is prevalent among different native people and presents a major socioeconomic problem, with an overall incidence estimated at 6.2/100.000 or about 12.000 new cases per year (Adham et al., 2012).

NPC is a tumor derived from epithelial cells located in the posterior nasopharynx (Adham et al., 2012; Brennan, 2006; Thompson, 2007). Although the primary tumor is sensitive to radiotherapy, mortality and morbidity occur because of secondary spread of tumor cells (Wang et al., 2005). These tumors are highly malignant with extensive and early lymphatic spread and a high incidence of hematogenous spread (Thompson, 2007). The prognosis remains poor with a 5-year survival around 50% (Wang et