



Expression levels of survivin, Bcl-2, and KAI1 proteins in cervical cancer and their correlation with metastasis

X.L. Zhou¹ and M. Wang²

¹Department of Gynecology, Liaocheng Second Hospital, Taishan Medical College, Linqing, Shandong Province, China

²Department of Pathology, Liaocheng Second Hospital, Taishan Medical College, Linqing, Shandong Province, China

Corresponding author: X.L. Zhou
E-mail: xinlingShandong96@163.com

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ABSTRACT. Cervical cancer is associated with abnormal expression of multiple genes. Survivin and Bcl-2 proteins are apoptosis inhibitors. The tumor suppressor gene *CD82*, which encodes the protein KAI1, is downregulated in cervical cancer, and is associated with differentiation degree. We investigated the expression levels of three proteins and their correlation with metastasis in cervical cancer by comparing them in different cervical lesions. Immunohistochemistry was used to detect their three protein expression levels in the normal cervix, chronic cervicitis, cervical intraepithelial neoplasia (CIN) lesions, and cervical cancer. The relationships between the protein expression levels and tumor type, clinical stage, tissue differentiation, invasion, and metastasis were analyzed. Survivin and Bcl-2 expression levels in cervical cancer were significantly higher than in the normal cervix, chronic cervicitis, or CIN ($P < 0.05$). KAI1 expression was markedly lower in cervical cancer than in the normal cervix, chronic cervicitis, or CIN ($P < 0.05$). There was no statistical difference between the expression levels of the three proteins in CIN and

chronic cervicitis, but there were differences in expression between CIN and normal cervical tissues ($P < 0.05$). Bcl-2 and survivin levels were positively correlated while KAI1 expression was negatively correlated with clinical stage. Survivin and KAI1 expression levels were associated with lymph node metastasis ($P < 0.05$), and KAI1 expression was positively related with differentiation degree ($P < 0.05$). Survivin, Bcl-2, and KAI1 are metastasis-related factors in cervical cancer. Overexpression of survivin and Bcl-2, and low expression of KAI1 promotes cervical cancer progress and metastasis.

Key words: Cervical cancer; Bcl-2, Survivin; KAI1; Metastasis