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Expression of galectin-3 and its clinical significance in adenocarcinoma liver metastasis

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Background:

Patients with metastatic liver diseases without evidence of certain primary origins require better immunohistochemical study to define specific organ origin and to indicate appropriate management including effective chemotherapy regimens. Expression of galectin-3, a galactoside-binding protein, has been associated with malignant transformation, cancer progression through angiogenesis and metastasis, and inhibition of apoptosis in several malignancies such as breast, lung, and gastrointestinal cancers. Adding galectin-3 to cytokeratin immunohistochemistry may assist clinicians to diagnose of primary tumor sites in patients without definitive primary origins clinically.

Methods:

From June 2006 to December 2007, consecutive patients from Prince of Songkla University Hospital with histological-proven metastatic adenocarcinoma to the liver diagnosed in Pathology Department for whom clinical data of definitive primary site available were recruited to the study. Histological slides from liver biopsy of patients diagnosed with adenocarcinoma liver disease were reviewed by the study pathologist to confirm diagnosis.

Immunohistochemical staining was done with primary antibodies for galectin-3 (NCL-GAL3), cytokeratin-7 (CK-7) and cytokeratin-20 (CK-20) from paraffin embedded tissues. The extent of galectin-3 staining was categorized into 4 groups: negative (no tumor cell staining), weak (1-25% of tumor cells stained), moderate (26-65% of cells

stained), and strong (> 65% of cells stained). Data on primary sites of cancer and clinical characteristics of all patients were collected and correlated with the immunohistochemical staining.

Results:

From 17 eligible patients recruited, primary tumors were biliary cancer (8 pts), pancreas (5), lung (2), colorectal (1), and breast (1). Eight patients were male and 9 were female with a median age of 66 years (range, 46-84). Twenty-nine percent of them strongly expressed galectin-3 whereas 53% showed weak to moderate degree of staining and 18% were negative for galectin-3.

Moderate to strong expression of galectin-3 was found in 63% of biliary cancers and in 40% of pancreatic cancers. Positive CK-7 in combination with negative CK-20 staining was found in 94% of patients and mostly representing biliary tract (47%) and pancreatic (24%) cancers. Patients with pancreatic and biliary liver metastases had the poorest survival with median overall survival of 1 and 2.5 months, respectively.

Conclusion:

Galectin-3, adding to cytokeratin immunohistochemical study, seems to be a potential diagnostic marker for metastatic liver disease originating from biliary and pancreatic cancers. Larger patient cohort studies are encouraged.

Keywords: galectin-3, adenocarcinoma, liver metastasis, Thailand