Sophora Japonica Agglutinin Reveals Aberrant Glycosylation in Cholangiocarcinoma

Waraporn Saentaweesuk[1,3], Atit Silsirivanit[1,3], Somsiri Indramanee[1,3], Somchai Pinlaor[2,3], Thidarut Boonmars[2,3], Kulthida Vaeteewoottacharn1[,3], Chaisiri Wongkham[1,3]

[1]Department of Biochemistry, [2]Department of Parasitology, [3]Liver Fluke and Cholangiocarcinoma Research Center, Faculty of Medicine, Khon Kaen University, Khon Kaen, 40002, Thailand

Background and Objective: Cholangiocarcinoma (CCA), a malignancy of bile duct epithelia, is a rare cancer worldwide but has high incidence in Khon Kaen province, Thailand. Most of CCA patients are diagnosed at late stage with distant metastasis and poor survival. Aberrant glycosylation has been demonstrated in many cancers including CCA. The aberrant glycans and glycoconjugates were reported to be the markers for diagnosis and prognostic prediction of the cancer.

Method: We determined the expression of *N*-acetylgalactosamine (GalNAc) in CCA patient tissues using *Sophora japonica* agglutinin (SJA), a GalNAc binding lectin by lectin histochemistry.

Result: The SJA histochemistry showed that SJA-binding glycoconjugates (SBG) were highly detected in hyperplastic/dysplastic bile ducts (81.3%, 26/32) and neoplastic bile ducts (77.3%, 34/44) but was not detected in normal bile ducts, hepatocytes and the infiltrating cells. The SJA histochemistry of *Opisthorchis viverrini* (OV) associated CCA hamsters revealed that the abnormal bile ducts of the OV-infected, NDMA-treated, and OV-NDMA groups expressed SBG as early as one month post-treatment. No SBG was detected in normal bile duct epithelia of non-treated group. This information suggested that SBG may associate with carcinogenesis of CCA. SJA histochemistry of hepatocellular carcinoma tissues (HCC) was performed to validate the specificity of SBG. In contrast with CCA, most of HCC tissues (92.3%, 12/13) showed negative staining for SBG. This evidence suggested the potential of using SBG to differentiate CCA from HCC.

Conclusion: SBG was defined in abnormal bile ducts and may be used as biomarker for early detection of CCA and differentiating CCA from HCC.

Key word: Lectin, Biomarker, SJA, Carbohydrate antigen, Glycoconjugate, Glycosylation

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