# predictors of malignancy in biliary mucin-producing cystic neoplasms

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## OBJECTIVES

Biliary mucin-producing cystic neoplasms (BMPCN) have been known as precancerous lesions of cholangiocarcinoma. Although surgical resection is the choice of treatment, the lesions with low or intermediate grade dysplasia can be closely observed because of good prognosis. So, we evaluated the predictors of malignancy in BMPCN such as intraductal papillary neoplasm of the bile duct and biliary mucinous cystic neoplasm.

## METHODS

This research retrospectively reviewed total 37 patients with BMPCN who underwent pathologic confirmations by surgical resections. Analyzing epidemiological characteristics, laboratory findings, and comorbidity were conducted based on the following two subgroups: premalignant lesion only (18 patients) and premalignant lesion with malignancy (19 patients). We checked all cases for finding mural nodules, bile duct dilatation, and abrupt narrowing of the bile duct by using abdominal computed tomography (CT).

## RESULTS

Table 1. Clinical and radiologic characteristics for predicting malignancy in univariate anaylsis

| | Premalignant lesion with malignancy (N=19) | Premalignant lesion only (N=18) | *P*-value |
|---|---|---|---|
| Age (median±SD) | 70.42±6.76 | 64.5±10.11 | 0.043 |
| over 70 | 13 | 5 | 0.031 |
| Sex (male/female) | 12/7 | 12/6 | 0.829 |
| Laboratory Finding | | | |
| CEA | 9.99±21.91 | 2.88±1.46 | 0.255 |
| CA19-9 | 1500.1±3564.6 | 422.2±1458.2 | 0.266 |
| >300 U/mL (N) | 9 | 2 | 0.015 |
| Total bilirubin | 4.92±9.60 | 3.47±6.75 | 0.609 |
| >3 mg/dL (N) | 6 | 5 | 0.807 |
| Lesion location | | | 0.802 |
| Extra-hepatic | 4(21.0) | 3(16.6) | |
| Intra-hepatic | 8(42.1) | 13(72.2) | |
| Peri-hilar | 7(36.8) | 2(11.1) | |
| Duct size(mm) | 11.84±5.26 | 11.66±4.80 | 0.916 |
| Mural nodule (N) | 12 | 3 | 0.003 |
| over 20mm (N) | 7 | 1 | 0.002 |
| Abrupt change of the bile duct (N) | 11 | 4 | 0.027 |

Table 2. Clinical and radiologic characteristics for predicting malignancy in Multivariate Logistic Regression Analysis

| | OR | Range | *P*-value |
|---|---|---|---|
| Age [over 70] | 6.37 | 1.15-35.2 | 0.034 |
| Gender [male] | 6.3 | 0.58-69.1 | 0.13 |
| TB [over3] | 0.193 | 0.01-2.6 | 0.219 |
| Ca19-9 [over 300] | 3.97 | 1.12-14.0 | 0.032 |
| Mural nodule size [over 20mm] | 10.32 | 1.54-68.7 | 0.016 |
| Abrupt ductal change [yes] | 1.32 | 0.54-9.3 | 0.53 |

Age over 70 (p=0.031) and CA 19-9 over 300 U/mL (p=0.015) were shown as significant predictors of malignancy. BMPCN with mural nodule (p=0.002) and abrupt change of the bile duct (p=0.027) was more likely in malignancy. Age over 70 (OR: 6.37, 95% CI: 1.15-35.2, p=0.034), CA19-9 over 300 U/mL (OR: 3.97, 95% CI: 1.12-14.0, p=0.032) and mural nodule over 20mm (OR: 10.32, 95% CI: 1.54-68.7, p=0.016) were independent predictors of malignancy. The lesion that had more than 2 of 4 points (age over 70, CA19-9 over 300 U/mL, mural nodule over 20mm and abrupt change of the bile duct) had high accuracy for predicting malignancy (sensitivity: 84.2%, specificity: 83.3%, AUC = 0.867).

Table 3. Scoring of malignancy predictors

| | Sensitivity (%) | Specificity (%) |
|---|---|---|
| Malignancy (AUC=0.867) | | |
| 1 of 4 | 94.7 | 27.8 |
| 2 of 4 | 84.2 | 83.3 |
| 3 of 4 | 57.9 | 94.4 |

## CONCLUSIONS

This study strongly say that old age, high CA 19-9 level and presence of mural nodule are the predictors of malignancy in BMPCN. From the study, we can tell that we cannot rule out malignancy if more than 2 of 4 factors are positive. We also suggest that a well-designed large scale study will be needed for the confirmation of the result.

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