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《Background》

Pancreatic cancer is a highly lethal malignancy. CA19-9 is a well-known tumor marker that shows a high sensitivity for diagnosis of pancreatic cancer¹⁾²⁾. A serum CA19-9 level of 37 units/ml has been reported to be the optimum cut-off value for diagnosis of pancreatic cancer. However, the serum level of CA19-9 is elevated in patients with poorly controlled diabetes³⁾⁴⁾⁵⁾.

《Aim》

This study was performed to evaluate the sensitivity, specificity, and cut-off value of serum CA19-9 for early detection of pancreatic cancer in patients with diabetes.

《Method》

This was a case-control study of 236 subjects admitted to hospital between April 2007 and March 2017. The case group was selected from diabetic patients with pancreatic cancer, while one control was selected from each case from among diabetic patients without pancreatic cancer during the same period. Patients were excluded if they had other malignancies. The case group was matched with the control group for age, sex, and risk factors for pancreatic cancer (BMI, HbA1c, smoking, and drinking alcohol).

Receiver operating characteristic (ROC) curves were plotted to determine the serum CA19-9 level predicting pancreatic cancer. The sensitivity and specificity of CA19-9 were calculated for the threshold value.

《Result》

Table 1. Characteristics of the subjects

	Control group (n=118)	Case group (n=118)	<i>p</i>
Age (years)	70.3 ± 8.6	71.1 ± 8.9	0.491
Sex (male/female) (%)	77 / 41 (65.3 / 34.7)	76 / 42 (64.4 / 35.6)	1.000
BMI (kg/m ²)	22.5 ± 4.2	22.3 ± 4.1	0.599
Smoking (no/past/yes) (%)	57 / 25 / 36 (48.3 / 21.2 / 30.5)	49 / 26 / 27 (48.0 / 25.5 / 26.5)	0.691
Alcohol intake (no/yes) (%)	82 / 36 (69.5 / 30.5)	76 / 31 (71 / 29)	0.884
HbA1c (%)	8.9 ± 2.0	9.1 ± 2.0	0.642

mean±SD or N

	Control group (n=118)	Case group (n=118)	<i>p</i>
CA19-9 (U/mL)	15.0 [9.7, 22.2]	370.0 [49.3, 2697]	<0.001
Glycoalbumin (%)	27.6 ± 8.0	32.5 ± 7.8	<0.001
Hemoglobin (g/dL)	12.6 ± 2.2	12.6 ± 1.7	0.839
Albumin (g/dL)	4.1 ± 0.5	4.0 ± 0.5	0.092
Duration of diabetes (years)	14.5 ± 11.9	8.0 ± 9.1	<0.001

mean±SD or median [interquartile ratio]

Though there was no correlation between HbA1c and the serum concentration of CA19-9 in the control group ($r=0.186$, $P=0.55$), 15 (12.7%) patients were false positives using the cutoff value of 37 U/mL (Fig. 1).

ROC analysis showed that the area under the ROC curve (AUC) was 0.875 [95%CI: 0.826- 0.924] and the cut-off value of serum CA19-9 that demonstrated the maximum sensitivity and specificity for separating patients with or without pancreatic cancer was 75 U/mL (Fig. 2).

Using this cut-off value, the sensitivity and specificity of CA19-9 for detecting pancreatic cancer was 69.5% and 98.2%, respectively. This cut-off value showed a higher diagnostic accuracy for pancreatic cancer than the conventional standard value of 37 U/mL (83.9% vs. 82.2%, respectively).

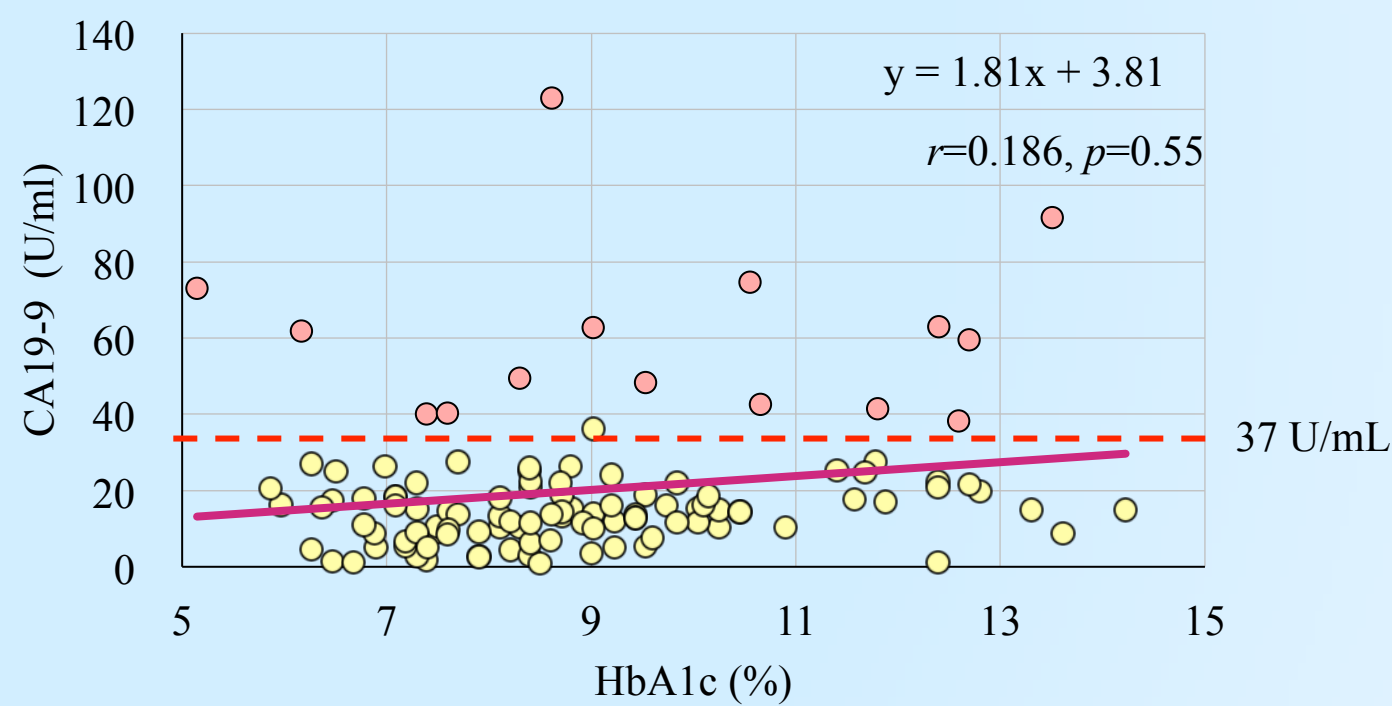


Figure 1. Correlation between HbA1c and CA19-9 in the control group.

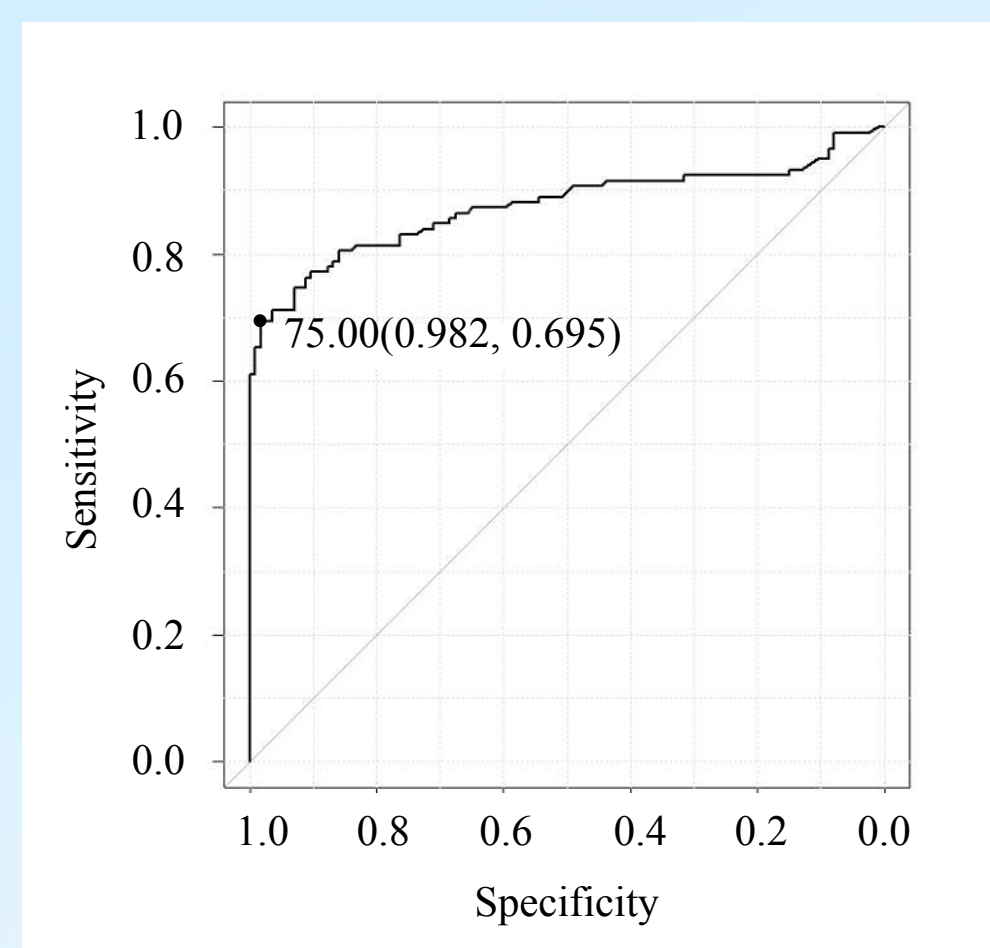


Figure 2. ROC curve for predicting the presence of pancreatic cancer in patients with diabetes by various cut-off values of CA19-9.

《Discussion》

When CA 19-9 exceeds 75 U/mL, the probability of pancreatic cancer is high and detailed investigations should be performed, such as contrast CT, pancreatic endoscopic ultrasound, or magnetic resonance cholangiopancreatography, rather than relying on simpler tests such as abdominal ultrasonography.

It has been reported that an elevated serum levels of CA19-9 in patients with diabetes were decreased within 2 weeks by improvement of glycemic control⁶⁾⁷⁾⁸⁾. Therefore, when serum CA 19-9 is between 37 and 75 U/mL, it would seem reasonable to re-examine the patient at least 2 weeks after improvement of glycemic control.

《Conclusions》

We propose that the cut-off value of serum CA19-9 should be set at 75 U/mL when screening patients with diabetes for pancreatic cancer. A positive result should encourage clinicians to perform detailed investigations to detect pancreatic cancer.

《References》

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