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ORIGINAL ARTICLE

The Clinical Value of HSP60 in Digestive System Cancers: a Systematic Review and Meta-Analysis

Yan Chen [1], Xiaoyu Li [2], Shengwen Shao [2, *]

[1] *Department of Nursing, School of Medicine and Nursing Science, Huzhou University, Huzhou, P.R. China*
[2] *The Institute of Microbiology and Immunology, Schools of Medicine and Nursing Science, Huzhou University, P.R. China*

SUMMARY

Background: **Heat shock protein 60 has been reported to have a high diagnostic value for digestive system cancers. We sought to systematically evaluate the diagnostic value of HSP60 in patients with gastric cancer (GC), colorectal cancer (CRC), and hepatocellular carcinoma (HCC).**
Methods: **Relevant literature was adopted from the online databases. The pooled sensitivity, specificity, and diagnostic odds ratio (DOR) were pooled using random effects models. Summary receiver operating characteristic curve and the area under the curve (AUC) were used to express the overall test performance. Statistical analysis was performed by STATA 14.0 and Meta-DiSc 1.4 software.**
Results: **We merged 12 studies in a meta-analysis, including 1 GC, 5 CRC, and 6 HCC. Overall, the pooled sensitivity, specificity, and DOR to predict GC/CRC/HCC patients were 70%, 71%, and 8.49, respectively, corresponding to an AUC of 0.81. In subgroup analysis, the 82% specificity prompted a more advanced diagnostic accuracy for diagnosing CRC than HCC.**
Conclusions: **HSP60 was an advanced biomarker for digestive system cancers and its abnormal expression might have implications for early diagnosis in screening of GC/CRC/HCC.**
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Correspondence:
Shengwen Shao
Institute of Microbiology and Immunology
759, East 2nd Road
Huzhou University
Wuxing District, Huzhou, Zhejiang, 313000
P.R. China
Email: shaoshw@zjhu.edu.cn

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Supplementary Tables and Figures.

Table 1. Meta-regression for the potential source of heterogeneity.

Study covariates	p-value	RDOR	95% CI
Country	0.69	1.13	0.50 - 2.55
Year	0.612	0.81	0.27 - 2.40
Quality	0.212	0.54	0.17 - 1.70
Cutoff	0.254	0.35	0.04 - 3.09
Assay type	0.557	0.54	0.04 - 7.73
Cancer type	0.533	1.57	0.25 - 9.87

If covariates have a missing value, use 0 instead during meta-regression.

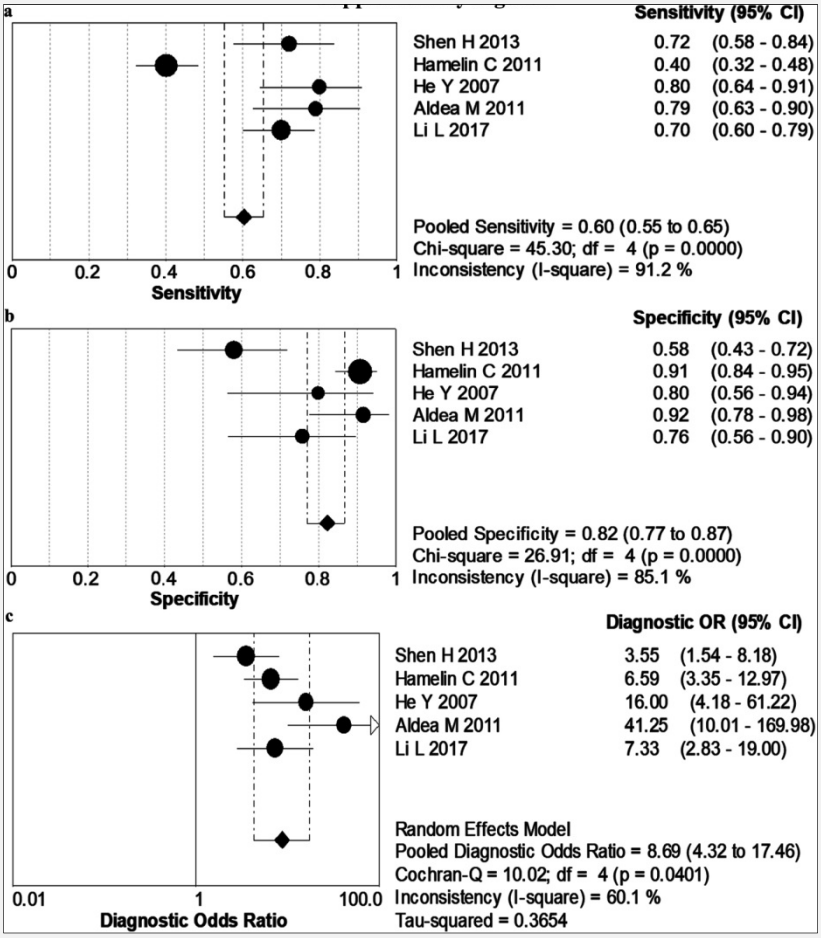

Figure 1. The forest plots show the pooled diagnosis index of HSP60 for the diagnosis of CRC.

The individual study symbol is shown as circle and the pooling symbol is shown as square. Inconsistency is used to quantify the heterogeneity caused by non-threshold effects. For five studies, Dersimonian-Laird (REM) was used to pool these data. (a,b) pooled sensitivity and specificity, (c) pooled DOR, and their 95% CI are illustrated separately, which shows HSP60 can be a potential diagnosis biomarker of CRC.

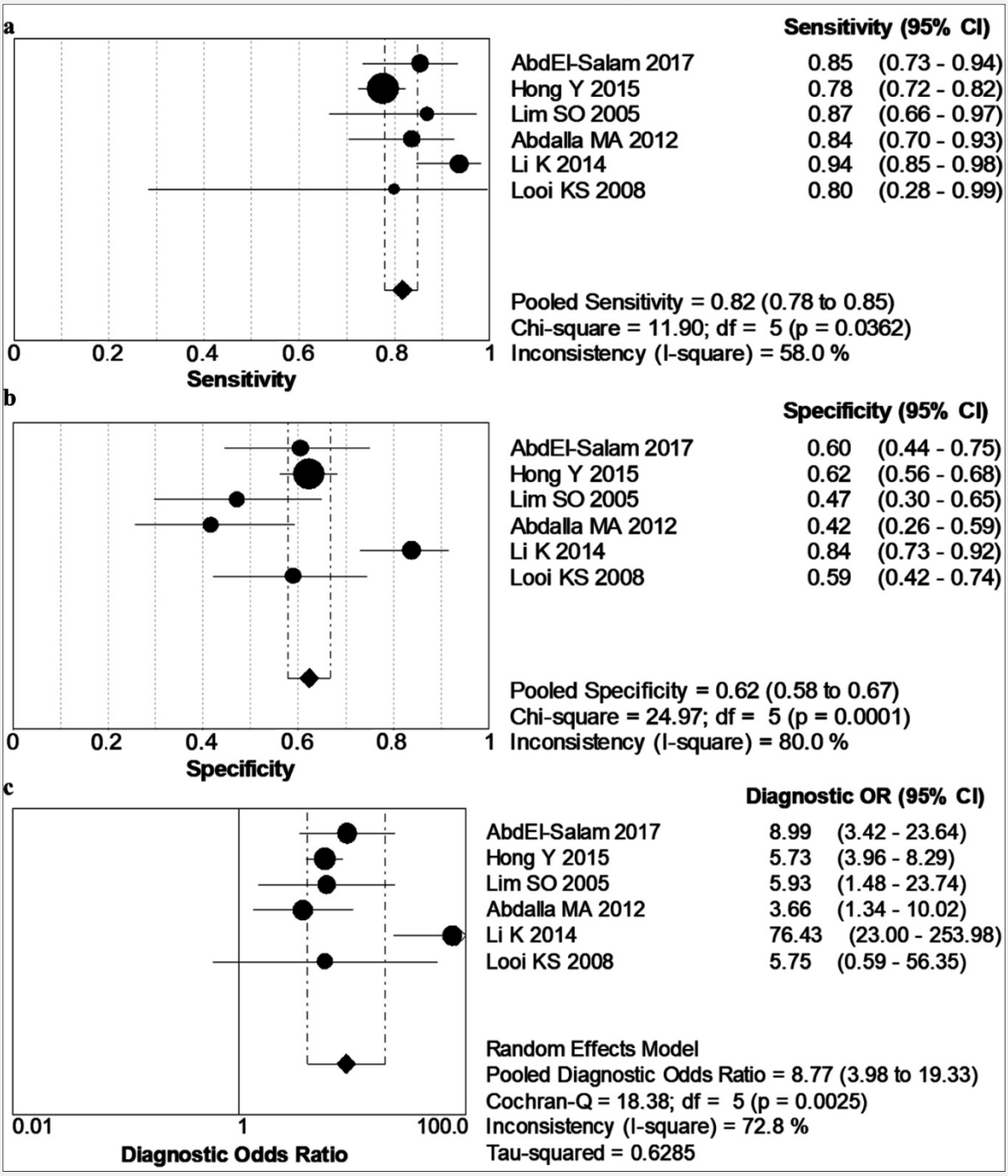

Figure 2. The forest plots show the pooled diagnosis index of HSP60 for the diagnosis of HCC.

The individual study symbol is shown as circle and the pooling symbol is shown as square. Inconsistency is used to quantify the heterogeneity caused by non-threshold effects. For six studies, Dersimonian-Laird (REM) was used to pool these data. (a,b) pooled sensitivity and specificity, (c) pooled DOR, and their 95% CI are illustrated separately, which shows HSP60 can be a potential diagnosis biomarker of HCC.

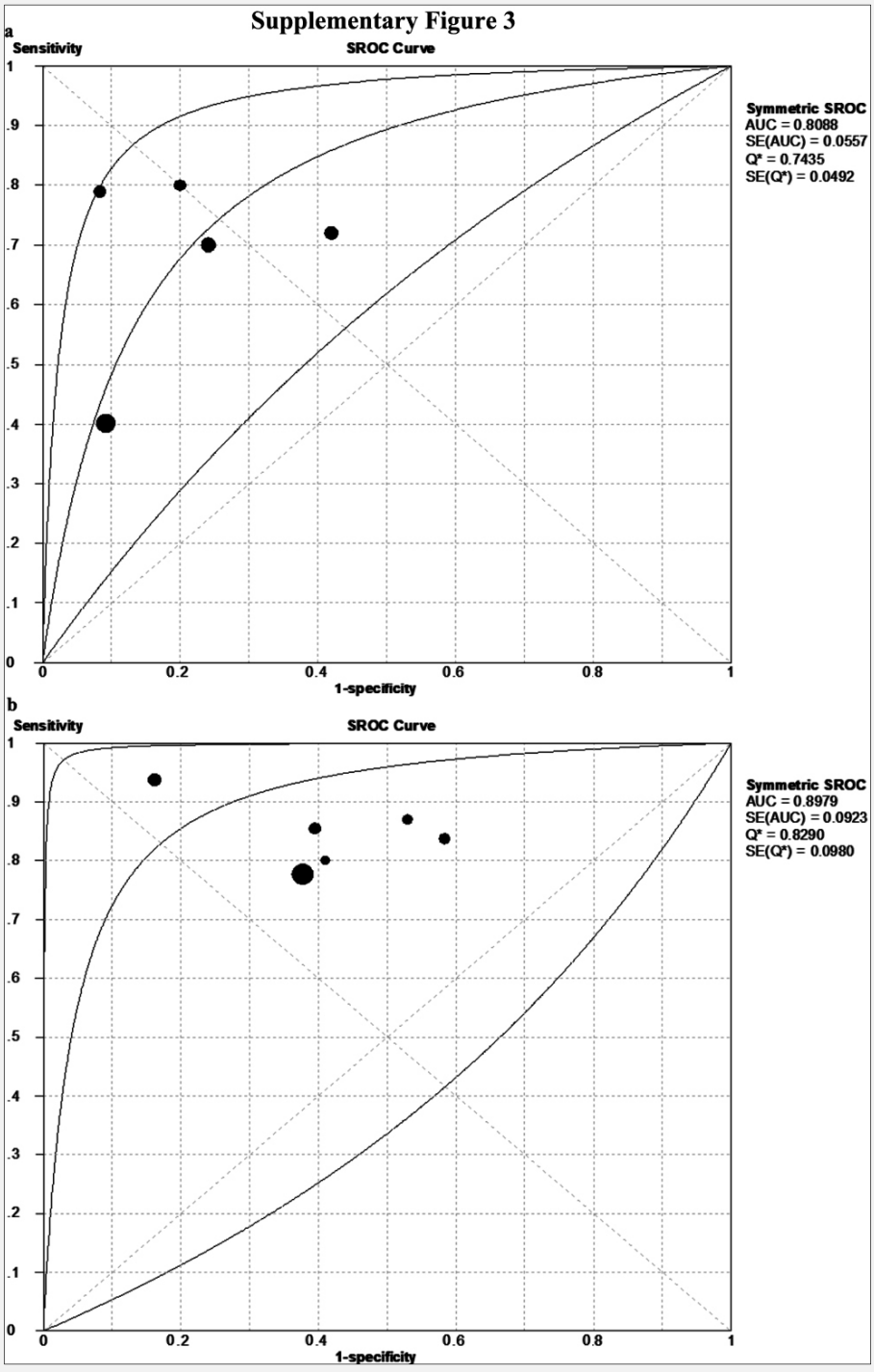

Figure 3. Summary receiver operating characteristic curves (SROC) for HSP60 expression outline in the diagnosis of CRC and HCC.

Every circle represents an included study. The SROC curve is symmetrical. (a) the AUC of CRC is 0.81, (b) 0.90 for HCC, which suggests an advanced diagnostic accuracy for CRC and HCC.

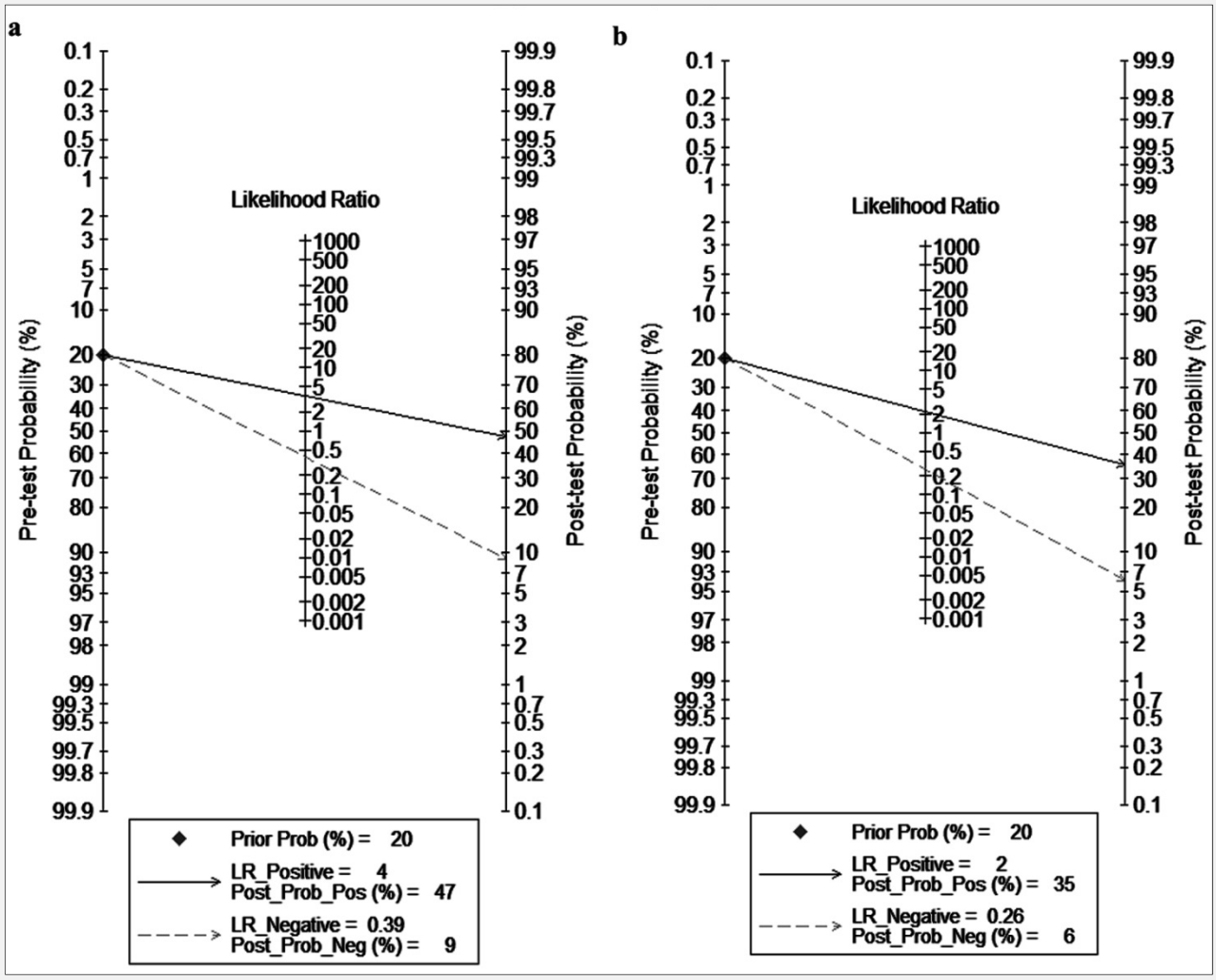

Figure 4. Fagan's nomogram for CRC and HCC.

For any person with a pre-test probability of 20% to have CRC or HCC, if the HSP60 test in cancer detection is positive, the post-test probability to have CRC will rise to 47%, while a negative result of HSP60 assay means the post-test probability will drop to 9% for the same person. But the probability of any person will only rise to 35% if HSP60 test is positive and will drop to 6% when HSP60 test is negative. That is, if HSP60 test in any person's blood is positive, he will have a higher risk of developing colon cancer than liver cancer. (a) CRC; (b) HCC.