RESEARCH COMMUNICATION

Preoperative Serum Carcinoembryonic Antigen, Carbohydrate Antigen 19-9 and Carbohydrate Antigen 125 as Prognostic Factors for Recurrence-free Survival in Colorectal Cancer

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Abstract

Objective: Colorectal cancer (CRC) is among the most common malignancies worldwide. Understanding CRC prognosis at the initial diagnosis is very important for therapeutic strategy selection. This study was conducted to evaluate the prognostic value of preoperative serum carbohydrate antigen 19-9 (CA19-9), carcinoembryonic antigen (CEA) and carbohydrate antigen 125 (CA125) for predicting 5-year recurrence-free survival (RFS) in CRC patients.

Methods: Preoperative serum CA19-9, CEA and CA125 levels were detected by C12 protein chip diagnostic system in 103 patients with CRC, and their correlations with the 5-year RFS were analyzed.

Results: Patients with positive preoperative serum CA19-9, CEA and CA125 had higher 5-year recurrent rates (75.0% vs 41.0%, 65.6% vs 39.4%, and 87.5% vs 44.2% respectively, all p<0.05), and reduced median RFS (14 vs 35 months, 20 vs 36 months, and 4 vs 35 months respectively, all p<0.05) compared with patients negative for corresponding tumor marker (TM). The median RFS was 59 months (95% CI 28.9-89.1 months) with negative TMs, 14 months (95% CI 4.5-23.5 months) for 1~2 positive TMs, and 4 months (95% CI 2.4-5.6) for all 3 positive TMs. Patients with simultaneously positive serum CA19-9, CEA and CA125 had the highest recurrence rate (100%) and the shortest RFS (median 4 months). Univariate analysis showed that stage and the preoperative single TM or combined TMs correlated with RFS, whereas multivariate Cox regression model analysis revealed only stage and preoperative serum status of CEA+CA19-9+CA125 to be independent prognostic factors.

Conclusion: Preoperative serum CA19-9+CEA+CA125 can be used an independent prognostic factor for CRC 5-year RFS.

Keywords: Colorectal cancer - CA 19-9 - CEA - CA-125 - recurrence-free survival - China

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Introduction

Colorectal cancer (CRC) is among the most common malignancies worldwide, with an estimated 1.2 million new cases and 0.6 million deaths each year (Jemal et al., 2011). Information form 2010 Health Statistical Yearbook of China showed that the morbidity and mortality of CRC ranked fifth in China during 2004-2005 (Ministery of Health of the People’s Republic of China, 2010). With changes in lifestyle, diet and disease spectrum, the incidence of CRC has been on the steady increase in recent years.

Tumor marker (TM) is a substance that can be detected in the blood, urine, or other body fluids or tissues in patients with cancer, which could be an important tool in cancer diagnosis, prognosis, treatment decision making and disease monitoring (Zhang et al., 2009). With the development of molecular biological techniques and new discoveries in cancer biology, many serum TMs such as carcinoembryonic antigen (CEA), carbohydrate antigen 19-9(CA19-9), carbohydrate antigen 242, carbohydrate antigen 724 and tissue inhibitor of metalloproteinase type 1, etc. have been explored. The American Society of Clinical Oncology (ASCO) and European Group on Tumor Markers (EGTM) published and updated evidence-based clinical practice guidelines for the use of TMs in CRC (Locker et al., 2006; Duffy et al., 2007). The guidelines stated that lack of specificity and sensitivity precluded the use of all existing serum markers for the early detection of CRC, only CEA had some values in prognosis, surveillance and monitoring. However, there was no such standard guideline for the use of serum TMs in CRC in China, and no better TMs used in clinical work. Many traditional TMs are still used in clinical practice. Considering ethnical and geographical factors, we investigated the clinical use of the commonly used serum TMs in CRC. Our previous study on the application of C12 multi-tumor marker protein chip in 173 consecutive CRC patients, identified three relatively useful TMs, CEA, CA19-9 and carbohydrate antigen 125 (CA125) (Yang

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in CRC patients.

The guidelines of ASCO and EGTM recommended that CEA could be used in predicting prognosis, surveillance following curative resection and monitoring therapy in advanced disease (Duffy et al., 2007; Locker et al., 2006). The guidelines did not recommend CA19-9 as a useful TM in CRC, and even did not mention CA125 as a TM for CRC. This study confirmed the fact that the three individual TM was not an independent prognostic factor for 5-year RFS in patients with CRC. However, combination use of these TMs might be shown values in CRC. The 3 TMs combined detection was an independent prognostic factor in this study.

In comparison with other studies (Sun et al., 2009; Morita et al., 2004; Papk et al., 2009), this study had both consistency and inconsistency with theirs. Some considerations might account for the confusing and even contradictory results. First, different definitions of abnormal TM levels or different methods for TM detection were used. Second, different study may have different sample size and employ different ethnic or race group. Third, different statistical methods were used and may have resulted in different conclusions. Fourth, different definition of RFS may be taken. Fifth, different patients might experience different treatment and different follow-up periods. A study (Dogan et al., 2010) recently reported that perioperative blood transfusion was a factor related to disease-free survival and overall survival of CRC.

There are two main limitations in this study. One is the relatively small sample size; the other is too many patients losing follow-up, which may be produced some bias. However, the results in this study were very objective, resulting in different conclusions. Fourth, different statistical methods were used and may have resulted in different conclusions. Fourth, different definition of RFS may be taken. Fifth, different patients might experience different treatment and different follow-up periods. A study (Dogan et al., 2010) recently reported that perioperative blood transfusion was a factor related to disease-free survival and overall survival of CRC.

In conclusion, increased preoperative CA19-9+CEA+CA125 is an independent negative prognostic factor for 5-year RFS of patients with CRC.

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References


Yang QX, Li Y, Chen C, et al (2010). Preoperative serum carbohydrate antigen 125 level is an independent negative