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TOPIC HIGHLIGHT

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An overview of colorectal cancer survival rates and prognosis in Asia

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Abstract

Colorectal cancer is a rapidly rising trend in Asia. The incidence in many Asian countries is on par with the West. Several studies have provided data regarding the survival of patients with colorectal cancer. In Asia, the overall cure rate of colorectal cancer has not improved dramatically in the last decade, 5-year survival remaining at approximately 60%. Colorectal cancer survival time has increased in recent years, but mortality rate remains high. Although studies have determined a number of factors that can predict survival of patients after diagnosis, life expectancy has not been increased dramatically. It seems that among the prognostic factors explored so far, the most important are those that relate to early diagnosis of cancer. Primary detection is feasible since efficient screening modalities are available. Colonoscopic surveillance is needed, especially in subjects at higher risk.

Key words: Colorectal cancer; Survival rate; Prognosis; Asia

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INTRODUCTION

Colorectal cancer is the fourth most common cancer in men and the third most common in women worldwide. It accounts for an estimated 1.2 million new cancer cases and over 630 000 cancer deaths per year, almost 8% of all cancer deaths[1,2]. Colorectal cancer has become an important problem in Asian countries[3-7]. Reports from the World Health Organization (WHO) data set and from individual countries or cities in Asia show that the incidence of CRC is rising rapidly rising in regions within countries such as China, Japan, South Korea and Singapore[7-10]. These countries, have experienced a 2-4-fold increase in the incidence of colorectal cancer during the past few decades[11]. The overall prevalence of advanced colorectal neoplasm in asymptomatic Asians was also found to be comparable with other developed countries[12].

In recent decades, claims have been made of numerous variables being related to survival. The extent of bowel wall penetration, lymph node metastases, distant metastases, tumor differentiation and tumor stage have been regarded as factors of the utmost prognostic importance; and they have been the basis of most staging systems[13-27]. Despite numerous attempts to detect cancer at an early stage, the overall long-term outcome of patients curatively resected has not significantly changed in the last decade, the 5-year survival rate being approximately 60 percent. More than half of colorectal adenocarcino-

mas are still diagnosed only when the disease involves regional or distant structures[22].

Many studies have been performed, using univariate and multivariate methods to define the prognostic significance of various clinical and pathologic factors[13-21,23-33]. However, the accurate determination of prognostic factors for colorectal cancer remains a problem. The present study considered a number of clinical studies on significant factors that can predict patient outcome. We report the results of some previous studies focused on colorectal cancer and review the literature concerning estimation of survival rates and evaluation of clinical and pathologic prognostic parameters, with an emphasis on Asian countries. Relevant articles, in which univariate and multivariate analyses were used, were selected, and results are discussed.

SURVIVAL ANALYSIS

Several studies have provided data regarding the survival of patients with colorectal cancer. In Asia, the overall cure rate of colorectal cancer has not improved dramatically in the last decade in Asia, 5-year survival remaining at approximately 60%. While the highest survival rates were found in China, the lowest rate was reported in India (Figure 1)[21,24,34-40]. The 5-year survival for persons with colorectal cancer is 64% in the United States. If the disease is detected at an early stage, the 5-year survival rate increases to 90%. However, because of lack of screening programs in many countries, only 39% of colorectal cancers are diagnosed at this stage. From 1982 to 1992, relative survival rates for patients diagnosed with colorectal cancer in five developing countries, comprising China, Cuba, India, the Philippines, and Thailand, was estimated at between 28 to 42%[1]. A report from Korea indicated that the 5-year survival rates were 62.1%[41]. In China, the overall 5-year post-operative survival rate was 60.8% in colorectal cancer patients, 62.3% in colonic cancer and 59.3% in rectal cancer. Another Chinese study reported an overall 5-year survival rate of 66.3%[34]. Various research studies from Iran have indicated the 5-year survival rates of colorectal cancer were 47%[35], 41%[36] and 61%[21], respectively.

According to one Japanese study, the overall 5-year survival rate was 61.4%[42]. The overall 5-year survival rate for colorectal cancer patients was 34.3%, lower than in either other Asian or Western countries[24]. However, results from Bombay, India indicated the lowest overall 5-year survival rates for colon and rectal cancer (31.2%)[43,44]. Data on this issue are scant in countries including Indonesia, Malaysia, Taiwan, and in Arab countries. In total, it seems that 5-year overall survival rates of colorectal cancer patients differ between Eastern and Western Asia. While the overall survival rates for colorectal cancer in South-West Asia were relatively lower than in US and European countries, in East Asia, rates are similar to those of Western communities. The main reason for the lack of progress is that currently a significant proportion of patients are diagnosed at later stages of disease or patients with seemingly localized tumor already have undetectable metastasis, mostly in the liver. To improve survival rates, in addition to earlier detection, more aggressive (adjuvant) treatment of high risk patients would be a rational strategy. This requires development of new therapeutic procedures, as well as reliable stratification of patients according to high risk or low risk for recurrent disease. In recent years, many attempts have been made to improve the prediction of final outcome.

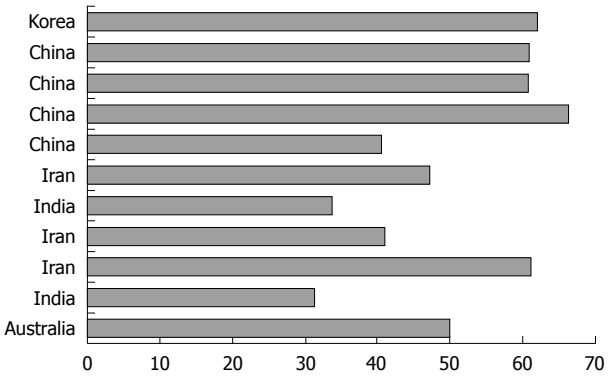

Figure 1 Overall 5-year survival of colorectal cancer in Asian countries[21,24,34-40].

PROGNOSTIC FACTORS

The prognostic factors for colorectal cancer were determined in various studies by both univariate (Kaplan-Meier) and multivariate (Cox proportional hazards model) methods. The most important independent prognostic factors related to survival of patients was determined by Cox models. Prognostic factors could be categorized as either demographic factors or pathological and clinical factors. In order to better compare the findings of various studies from different areas, the most important results are shown in Table 1[21,24,35,36,41-43,45,46].

Demographic factors

For a long time, prediction of patient outcome was attempted either by identification of patient attributes (age and sex) or from macroscopically evident tumor features. More recently, studies using multivariate analysis have clarified the prognostic role of clinical parameters. Patient gender has been extensively evaluated although in the majority of studies this was of no significance in predicting survival independently of other factors[14,19-21,24,25,35,38].

In the literature, results concerning patient age are even more diverse. In a number of studies[15,18,21,25,26], this parameter was not found to be an independent prognostic variable. However, in other reports[14,20,35,36], age did seem to play a role, predicting a poorer survival rate for older patients than younger ones.

Pathologic and clinical factors

Pathological evaluation is a critical component in the

Table 1 Comparison of the results from different countries

Study	Population	Year	Prognostic factors (indicated by univariate method)	Independent prognostic factors (indicated by multivariate method)
Mehrkhani *et al*[35]	Iran	1999-2002	Age, TNM stage, T-status, nodal status, distant metastasis, grade, lymphatic and vascular invasion, presurgery CEA level > 5 ng/mL	Age, TNM stage, grade
Shiono *et al*[42]	Japan	1999-2002	Aerogenous spread with floating cancer cell clusters (ASFC) vascular invasion, lymphatic invasion, pleural invasion	Vascular invasion, aerogenous spread with floating cancer cell clusters (ASFC)
Moghimi-Dehkordi *et al*[21]	Iran	2002-2007	Type of first treatment, body mass index, marital status, tumor grade, extent of wall penetration, distant metastasis, regional lymph nodes metastasis, and pathologic stage of tumor	Tumor size, metastasis of tumor, body mass index, marital status, and grade of tumor
Al-Shamsi *et al*[45]	United Arab Emirates	1985-1998	Age, Type of operation, Type of resection, lymph node status, peritoneal spread, liver metastasis, Dukes' staging, Lateral margins, Proximal and distal margins	Presence of lymph nodes and Duke staging
Moradi *et al*[36]	Iran	2000-2005	Age, sex, site of tumor, Type of tumor	-
Park *et al*[41]	Korea	1974-1993	Dukes' stage, extent of bowel wall invasion, lymph node metastasis and number of involved lymph nodes, preoperative CEA level, histologic grade, and gross morphology of the tumor	Dukes' stage, number of lymph node metastasis, CEA level, tumor location, gross morphology of tumor, depth of bowel wall invasion
Yeole *et al*[43]	India	1987–1991	Age, marital status, education, site (colon versus rectum), clinical extent of disease and treatment modality	Age group, site and clinical extent of disease emerged
Ghazali *et al*[24]	Malaysia	1996-2005	Age, sex, race, working status, smoking status, per rectal bleeding, liver metastasis, site of tumour, Dukes staging, preoperative CEA level and treatment modalities	Liver metastasis status, Dukes staging and treatment modalities
Goh *et al*[46]	Singapore	1987	Age, abdominal distension, Dukes' stage , tumour grade	Dukes' stage

management of patients with colorectal cancer. From initial diagnosis through definitive treatment, pathological assessment of a resected colorectal cancer is still considered the most accurate method of assessing the tumor-related features that determine postoperative outcome.

Different clinico-pathological prognostic factors have been proposed: location of the tumor[21,22,26,27,35,38], depth of tumor invasion[32,37,40], tumor stage[32,47], differentiation of tumor[20,21,48], surgical procedure[15,25], pathological type[25,48], tumor size[21,48-50], lymph node metastasis[21,51,52] and distant metastasis[15,25,48]. The site of the tumor has been investigated as a possible prognostic factor. Patients with colon cancer are considered to have a better survival than those with rectal cancer. In previous studies distal location and advanced stage of tumor were determined as independent prognostic factors for survival of patients with colorectal cancer. Several analyses confirmed the vital importance of tumor stage, as reflected in Dukes or TNM classification, in predicting survival. However, in the vast majority of studies documenting the prognostic power of tumor grade the number of grades has been reduced.

Although various studies have determined a number of factors that could predict survival of patients after diagnosis, life expectancy has not increased drastically. The review of the results from different reports shown in Table 1 supports the thesis that the pathological and clinical features of the disease may be better determinants for prognosis in colorectal cancer patients. It seems that among all the prognostic factors explored to date, the most important are those related to early diagnosis. Early detection or secondary prevention of cancer is increasingly important for the control of certain malignant diseases like colorectal cancer. CRC is more common in the elderly, although approximately 43 percent of colorectal cancer in Iran occurs before 50 years of age[53]. It is well established that colorectal cancer is one of those cancers that can largely be prevented by the early detection and removal of adenomatous polyps[54,55], and survival is therefore significantly better when colorectal cancer is diagnosed while still localized. Screening strategies are needed for early detection of colon adenomas and colorectal cancer.

CONCLUSION

In summary, colorectal cancer is a rapidly rising trend in Asia. The incidence in many Asian countries is in fact on a par with the West. Colorectal cancer survival time has increased in the past decades, but mortality rate remains high. Primary detection is feasible since efficient screening modalities are available. Colonoscopic surveillance is needed, especially in subjects at higher risk.

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