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Epidemiological characteristics and risk factors analysis of liver cancer in Guangxi

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Abstract: This study aims to explore the epidemiological characteristics and related risk factors of primary liver cancer in Guangxi. The research collected medical records of 610 patients diagnosed with liver cancer at the Affiliated Hospital of Youjiang Medical University for Nationalities from 2014 to 2023. Factors such as gender, age, ethnicity, urban-rural distribution, medical history, smoking history, alcohol consumption history, treatment methods, and complications were analyzed using a chi-square test. The results showed that liver cancer patients were primarily middle-aged males, with a higher proportion of Zhuang ethnic group and rural patients. There was a significant correlation between a history of liver disease and the onset of the disease. Although smoking and alcohol consumption did not show statistical significance, their potential risks still require attention. This study provides a scientific basis for early screening and prevention strategies for liver cancer and emphasizes the importance of health interventions targeting high-risk populations.

Keywords: Liver cancer, Epidemiology, Risk factors, Guangxi.

1 Introduction

Liver cancer is a malignant tumor that seriously threatens human health worldwide, and its incidence rate and mortality are particularly prominent in China (Forner & Reig, 2018; Miller, 1995) . According to statistics, the incidence rate of liver cancer ranks second among Chinese men and third among women. Its high mortality rate makes it a major challenge in the field of global public health (Qin et al., 2024). Research has shown that the occurrence of liver cancer is closely related to various risk factors, including hepatitis B and C virus infection, long-term heavy alcohol consumption, smoking, genetic factors, and exposure to environmental toxins(Hartke et al., 2017; Singal et al., 2023) .

Due to its unique geographical location and population composition in Guangxi, it exhibits significant differences in the epidemiological characteristics of liver cancer (Meng et al., 2023; Zhang et al., 2010) . The high prevalence of hepatitis B virus, the concentration of ethnic minorities mainly belonging to the Zhuang ethnic group, and the high proportion of rural

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population may work together to make this region one of the high-risk areas for liver cancer in China (Zhang et al., 2010; Zhang, 1989).
In addition, the region has relatively limited medical resources, insufficient coverage of health education, and weak health awareness among patients, which may further exacerbate the prevalence and diagnosis and treatment difficulties of liver cancer (Zhang et al., 2010; Zhang, 1989). Therefore, the study aims to provide scientific basis for the formulation of regional liver cancer prevention and treatment strategies by systematically analyzing the epidemiological characteristics and related risk factors of liver cancer patients in Guangxi. At the same time, the paper also discussed the necessity of intervention measures and health education for key populations in order to reduce the incidence rate and mortality of liver cancer in this area.

2 Methods

A total of 610 medical records of patients diagnosed with liver cancer by pathology at the Affiliated Hospital of Youjiang Medical University For Nationalities from January 1, 2014 to December 31, 2023 were selected for the study, including 519 males and 91 females, with an average age of onset of 53 years old, There were 97 Han patients, 437 Zhuang patients, and 76 other ethnic groups. 238 patients underwent surgical treatment and 372 patients underwent medication treatment. Statistical analysis was conducted on gender, age, ethnicity, urban-rural distribution, medical history, smoking history, alcohol consumption history, treatment methods, clinical diagnosis, presence of complications, and education level. The comparison of count data is conducted using the chi square test.

2.1 Inclusion Criteria

(a) Pathological diagnosis of primary liver cancer patient.
(b) The patient's medical records are complete.
(c) The patient is diagnosed with liver cancer for the first time in our hospital, or although they are diagnosed with liver cancer outside the hospital for the first time, their medical records are complete when they visit our hospital again.
(d) Local liver cancer patients in Guangxi.

2.2 Exclusion Criteria

(a) Patients with incomplete medical records.
(b) Follow up and treatment of patients.
(c) Non local patients in Guangxi.
(d) Non primary malignant tumor patients.

2.3 Grouping Method

Group comparisons were made based on gender, age, ethnicity, urban-rural distribution, medical history, smoking history, alcohol consumption history, treatment methods, clinical diagnosis, presence of complications, and education level.

2.4 Statistical Methods

After organizing, verifying, and inputting data, statistical analysis was conducted using SPSS 24.0 software on gender, age, ethnicity, urban-rural distribution, medical history, smoking history, alcohol consumption history, treatment methods, clinical diagnosis, presence of complications, and education level. The comparison of count data is conducted using the chi square test. All statistical analyses were conducted using a two-sided test, with a test level of $\alpha=0.05$. The statistical data showed significant differences with $P<0.05$.

3 Results

3.1 General clinical information of liver cancer patients

Out of 610 liver cancer patients, 519 were male (85.1%) and 91 were female (14.9%), with an average age of (53.32 ± 11.87) years. There were 71 patients in the young group, aged 20-39 years, accounting for 11.6%, 362 patients in the middle-aged group, aged 40-59 years, accounting for 59.3%, and 177 patients in the elderly group, aged ≥ 60 years, accounting for 29.0%. Other general clinical data are shown in **Table 1** and **Figure 1.**

Table 1 General clinical data of 610 liver cancer patients

Project		Number of cases	Constituent Ratio（%）
gender	male	519	85.1
	female	91	14.9
age	youth group（20~39 years old）	71	11.6
	Middle aged group（40~59 years old）	362	59.3
	Elderly group（≥60years old）	177	29.0
nationality	the Han nationality	97	15.9
	the Zhuang nationality	437	71.6
	others	76	12.5
urban and rural	rural	569	93.3
	Urban	41	6.7
history of family	Yes	20	96.7
	None	590	3.3
History of liver disease in the past	Yes	162	26.6
	None	448	73.4
smoking history	Yes	263	43.1
	None	347	56.9
History of Drinking	Yes	313	51.3
	None	297	48.7

continued

Treatment methods	surgical treatment	241	39.5
	drug treatment	369	60.5
clinical diagnosis	Primary liver cancer	520	85.2
	Non primary liver cancer	90	14.8
complication	Yes	235	38.5
	None	375	61.5
educational level	below High School	542	88.9
	High school (including vocational school) and above	68	11.1

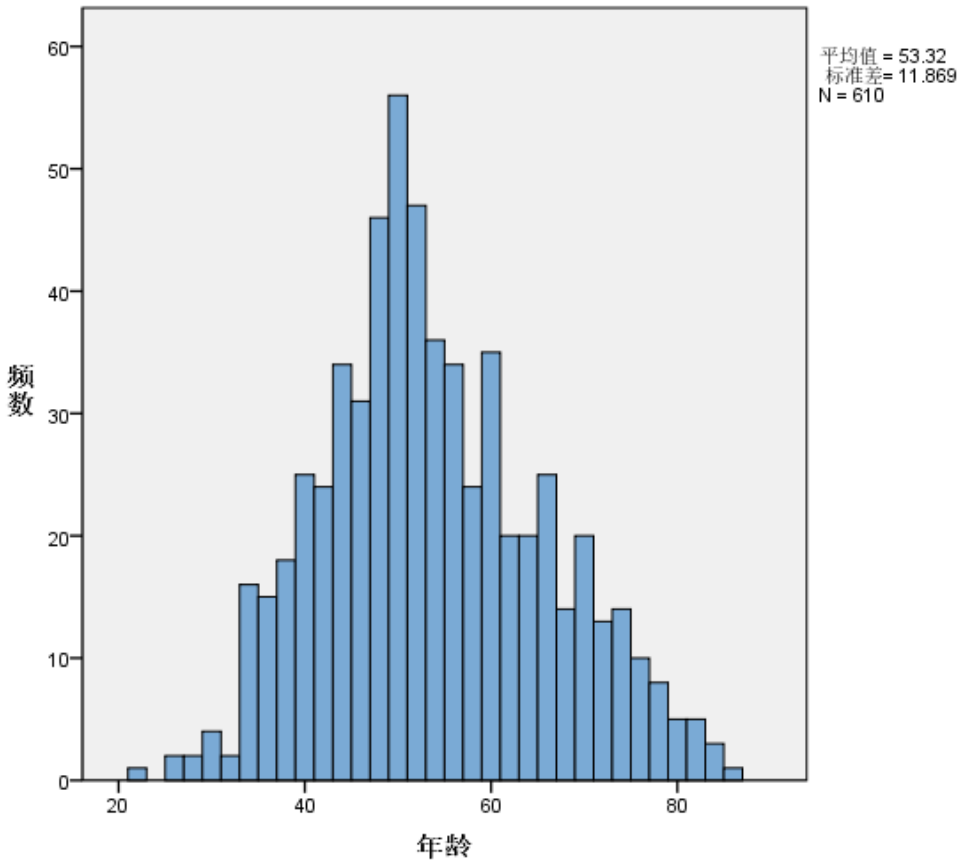

Fig. 1 Age distribution of 610 patients

3.2 Gender differences in liver cancer patients of different age groups

Compared with the youth and elderly groups, the proportion of males in the middle-aged group is as high as 61.8%, while the proportion of females in the youth group is only 9.9%. There is a statistically significant difference in gender among liver cancer patients of different age groups ($\chi2$=13.443, P=0.001). Multiple comparison analysis shows that there is no statistically significant difference in gender between young and middle-aged liver cancer patients ($\chi2$=0.106, P=0.745), and there is no statistically significant difference in gender between young and elderly liver cancer patients ($\chi2$=3.463, P=0.063). There is a statistically significant difference in gender between middle-aged and elderly liver cancer patients ($\chi2$=12.915,

P<0.001), and the proportion of male liver cancer patients in the middle-aged group is higher than that in the elderly group.

Table 2 Gender differences in liver cancer patients of different age groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
gender	male	62（11.9%）	321（61.8%）	136（26.2%）	13.443	0.001
	female	9（9.9%）	41（45.1%）	4（45.1%）		

4.3 Ethnic differences in liver cancer patients of different age groups

Compared with the youth and elderly groups, the Han proportion of liver cancer patients in the middle-aged group is as high as 52.6%, and the Zhuang proportion of liver cancer patients in the middle-aged group is as high as 59.3%. There is a statistically significant difference in the ethnicity of liver cancer patients in different age groups (χ 2=14.886, P=0.005). After multiple comparative analysis, there is no statistically significant difference in the ethnicity of liver cancer patients in different age groups. There was no statistically significant difference in the ethnicity of liver cancer patients between the young and middle-aged groups (χ2=0.015, P=0.901). There was no statistically significant difference in the ethnicity of liver cancer patients between the young and elderly groups (χ2=1.055, P=0.304). There was no statistically significant difference in the ethnicity of liver cancer patients between the middle-aged and elderly groups (χ2=2.347, P=0.126).

Table 3 Ethnic Differences in Liver Cancer Patients of Different Age Groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
nationality	the Han nationality	9（9.3%）	51（52.6%）	37（38.1%）	14.886	0.005
	the Zhuang nationality	48（11.0%）	259（59.3%）	130（29.7%）		
	others	14（18.4%）	52（68.4%）	10（13.2%）		

3.4 Differences in urban-rural distribution of liver cancer patients in different age groups

Compared with the youth and elderly groups, the proportion of rural patients in the middle-aged group was as high as 60.1%, while the proportion of urban patients was 48.8%. There was no statistically significant difference in the distribution of liver cancer patients in different age groups between urban and rural areas (χ 2=2.355, P=0.308).

Table 4 Differences in urban-rural distribution of liver cancer patients in different age groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
Urban and rural	rural	66（11.6%）	342（60.1%）	161（28.3%）	2.355	0.308
	Urban	5（12.2%）	20（48.8%）	16（39.0%）		

3.5 Differences in Family History of Liver Cancer Patients in Different Age Groups

Compared with other age groups, 85% of patients in the middle-aged group have a family history compared with other age groups, 58.5% of patients in the middle-aged group had no family history. There was a statistically significant difference in the presence or absence of family history among liver cancer patients of different age groups (χ 2=6.452, P=0.040). After multiple comparative analyses, there was no statistically significant difference in the presence or absence of family history between the young and middle-aged groups of liver cancer patients (χ 2=0.152, P=0.697). There was no statistically significant difference in the presence or absence of family history between the young and elderly groups of liver cancer patients (χ 2=0.679, P=0.410). There was a statistically significant difference in the presence or absence of family history between the middle-aged and elderly groups of liver cancer patients (χ 2=6.285, P=0.012). The incidence of liver cancer patients without family history was higher in the middle-aged group than in the elderly group.

Table 5 Differences in Family History of Liver Cancer Patients in Different Age Groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
History of families	yes	2（10.0%）	17（85.0%）	1（5.0%）	6.452	0.040
	none	69（11.7%）	345（58.5%）	176（29.8%）		

3.6 Differences in Past Liver History among Liver Cancer Patients of Different Age Groups

Compared with other age groups, 64.8% of middle-aged patients have a history of liver disease compared with other age groups, 57.4% of middle-aged patients have no history of liver disease. There was a statistically significant difference in the history of liver cancer among patients of different age groups (χ 2=8.706, P=0.013). Multiple comparative analysis showed that there was no statistically significant difference in the history of liver cancer between the young and middle-aged groups (χ 2=0.653, P=0.419), while there was a statistically significant difference in the history of liver cancer between the young and elderly groups (χ 2=6.578, P=0.010). The elderly group had a higher number of patients without a history of liver disease than the young group. There was a statistically significant difference in the history of liver cancer between the middle-aged and elderly groups (χ 2=6.700, P=0.010), with a higher proportion of patients without a history of liver disease in the middle-aged group compared to the elderly group.

Table 6 Differences in Past Liver History among Liver Cancer Patients of Different Age Groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
History of liver disease in the past	yes	24（14.8%）	105（64.8%）	33（20.4%）	8.706	0.013
	none	47（10.5%）	257（57.4%）	144（32.1%）		

3.7 Differences in smoking history among liver cancer patients of different age groups

Compared with other age groups, 59.7% of middle-aged patients have a history of smoking compared with other age groups, 59.1% of middle-aged patients have no smoking history. There was no statistically significant difference in smoking history among liver cancer patients of different age groups (χ 2=0.244, P=0.885).

Table 7 Differences in smoking history among liver cancer patients of different age groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
History of smoking	yes	32（12.2%）	157（59.7%）	74（28.1%）	0.244	0.885
	none	39（11.2%）	205（59.1%）	103（29.7%）		

3.8 Differences in alcohol consumption history among liver cancer patients of different age groups

Compared with other age groups, 63.6% of middle-aged patients have a history of alcohol consumption compared with other age groups, 54.9% of middle-aged patients have no history of alcohol consumption. There was no statistically significant difference in the history of alcohol consumption among liver cancer patients of different age groups (χ 2=0.244, P=0.885).

Table 8 Differences in alcohol consumption history among liver cancer patients of different age groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
History of Drinking	yes	36（11.5%）	199（63.6%）	78（24.9%）	5.670	0.059
	none	35（11.8%）	163（54.9%）	99（33.3%）		

3.9 Differences in treatment methods for liver cancer patients in different age groups

Compared with other age groups, 63.5% of patients in the middle-aged group underwent surgical treatment compared with other age groups, 56.6% of patients in the middle-aged group received non-surgical medication treatment. There is a statistically significant difference in

treatment methods among liver cancer patients of different age groups (χ 2=6.657, P=0.036). Multiple comparative analysis was conducted with a test level adjustment of 0.0166. There was no statistically significant difference in treatment methods between the young and middle-aged groups of liver cancer patients (χ 2=0.191, P=0.662). There was no statistically significant difference in treatment methods between the young and elderly groups of liver cancer patients (χ 2=3.994, P=0.046). There was no statistically significant difference in treatment methods between the middle-aged and elderly groups of liver cancer patients (χ 2=5.655, P=0.017).

Table 9 Differences in treatment methods for liver cancer patients in different age groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
Treatment methods	surgical treatment	32（13.3%）	153（63.5%）	56（23.2%）	6.657	0.036
	drug treatment	39（10.6%）	209（56.6%）	121（32.8%）		

3.10 Clinical Diagnostic Differences in Liver Cancer Patients of Different Age Groups

Compared with other age groups, 58.7% of middle-aged patients were diagnosed with primary liver cancer; Compared with other age groups, non-primary liver cancer accounted for 63.3% of patients in the middle-aged group. There was no statistically significant difference in clinical diagnosis between liver cancer patients of different age groups (χ 2=3.800, P=0.150).

Table 10 Clinical Diagnostic Differences of Liver Cancer Patients in Different Age Groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
clinical diagnosis	Primary liver cancer	66（12.7%）	305（58.7%）	149（28.7%）	3.800	0.150
	Non primary liver cancer	5（5.6%）	57（63.3%）	28（31.1%）		

3.11 Differences in comorbidities among liver cancer patients of different age groups

Compared with other age groups, 63.4% of patients in the middle-aged group had comorbidities compared with other age groups, 56.8% of patients in the middle-aged group had no comorbidities. There was no statistically significant difference in the comparison of comorbidities among liver cancer patients of different age groups (χ 2=3.563, P=0.168).

Table 11 Differences in comorbidities among liver cancer patients of different age groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
complication	yes	28（11.9%）	149（63.4%）	58（24.7%）	3.563	0.168
	none	43（11.5%）	213（56.8%）	119（31.7%）		

3.12 Educational level differences among liver cancer patients of different age groups

Compared with other age groups, 60.5% of patients in the middle-aged group have education levels below high school; Compared with other age groups, 50.0% of patients in the middle-aged group have high school (including vocational school) or above. There was no statistically significant difference in education level among liver cancer patients of different age groups (χ 2=2.784, P=0.249).

Table 12 Differences in Education Level of Liver Cancer Patients in Different Age Groups

project		youth group（n=71）	Middle aged group（n=362）	Elderly group（n=177）	χ^2	*P*
educational level	below High School	61（11.3%）	328（60.5%）	153（28.2%）	2.784	0.249
	High school (including vocational school) and above	10（14.7%）	34（50.0%）	24（35.3%）		

4 Discussions

The results of this study indicate that liver cancer patients are predominantly middle-aged men, with the Zhuang ethnic group being the most affected, and rural patients making up the vast majority. There are significant differences in the medical history of liver disease and treatment methods among different age groups. The research suggests that intensifying early screening and health education for middle-aged men, especially those from the Zhuang ethnic group, is of great importance for reducing the incidence of liver cancer (Alderwick et al., 2021).
Further analysis shows that the high incidence rate of Zhuang patients may be related to the high infection rate of endemic hepatitis B. In addition, the higher proportion of patients in rural areas may reflect differences in economic conditions, access to medical resources, and health awareness levels, which suggests the need to strengthen hepatitis vaccination and early screening services in rural areas (Zheng et al., 2018).

Although smoking and alcohol consumption did not show statistical significance, they are widely recognized in the literature as risk factors for liver cancer (Grewal & Viswanathen, 2012; Im et al., 2023). This suggests that larger sample sizes and longer follow-up periods

should be considered in research design to more comprehensively evaluate their impact. In addition, although drug therapy is more common in elderly patients, this may be related to their physical condition not being suitable for surgery (Eidam et al., 2020; Miller, 1995). Further research is needed in the future to evaluate the long-term effects of different treatment methods. According to the results of this study, the prevention and control of liver cancer in Guangxi needs to be optimized from the following aspects:

Intervention Measures for Key Populations

Early screening for liver cancer is particularly crucial for the Zhuang and middle-aged male populations. The coverage and frequency of screening should be increased, especially in these high-risk groups, because they have a high risk of hepatitis B infection rate and incidence rate of liver cancer (Song et al., 2013). By strengthening the collaboration between the public health system and local governments, policy support can be provided and special funds can be established to promote early screening projects for liver cancer, ensuring that relevant measures are fully implemented.

In Zhuang ethnic gathering areas and remote rural areas, the accessibility of screening services is often affected due to limitations in transportation and medical resources. Therefore, mobile screening devices can be used to regularly enter these areas for mobile screening services. This approach not only covers remote areas, but also reduces the difficulty for local residents to go to urban hospitals. At the same time, in conjunction with community education activities, local residents' awareness of liver cancer prevention and control is enhanced through health lectures, promotional brochures, volunteer training, and other forms, motivating them to participate in screening.

In addition, to ensure the continuity and effectiveness of screening, long-term follow-up and management of high-risk populations can be strengthened, potential liver cancer risks can be detected in a timely manner, and early intervention treatment or further testing can be carried out. Through these targeted measures, early diagnosis of liver cancer can be achieved among Zhuang and middle-aged men, thus effectively reducing their incidence rate and mortality.

Prevention and Control of Hepatitis B

Hepatitis B is one of the main risk factors for liver cancer, especially in high incidence areas such as Guangxi. Through health education, increasing public awareness of hepatitis B, including transmission routes, prevention measures, and the importance of treatment, can effectively reduce infection rates (Wang et al., 2022). In response to the high infection rate of hepatitis B, prevention and control measures need to be taken from multiple aspects. Firstly, the vaccination of hepatitis B vaccine should be strengthened, especially among high-risk populations, to enhance herd immunity and reduce the spread of hepatitis B virus (Qin et al., 2024). At the same time, promoting the popularization and standardization of antiviral therapy can effectively control virus replication, reduce liver damage, and prevent the occurrence of liver cancer for patients infected with hepatitis B virus through early antiviral intervention.

In order to improve the effectiveness of hepatitis B prevention and control, primary medical institutions should establish a registration and follow-up system for hepatitis B patients. This system can achieve real-time tracking and management of patients, ensuring timely diagnosis and treatment, reducing the risk of virus transmission, and adjusting treatment plans in a timely manner through regular follow-up to detect changes in the condition. In addition, establishing a data-driven management platform can provide a basis for policy makers to evaluate the effectiveness of hepatitis B prevention and control measures.

The maternal and child blocking project is also a key link in preventing and controlling hepatitis B. By screening pregnant women for hepatitis B virus infection and taking early antiviral treatment and immune intervention measures, the virus can be effectively prevented from being transmitted from mother to newborn, significantly reducing the incidence of hepatitis B infection in newborns. Strengthening the popularization of this project, especially in high-risk areas, can provide better health protection for the next generation and reduce the transmission chain of hepatitis B.

Health Education and Behavioral Intervention

Health education and behavioral intervention play a crucial role in the prevention and control of liver cancer. Health education should be covered at all levels such as schools, communities, and workplaces to ensure that people of different ages, professions, and living environments can receive scientific and effective health knowledge. The focus of education should include the prevention of hepatitis B, the importance of a balanced diet, and the promotion of healthy behaviors such as smoking cessation and alcohol restriction. Through systematic health education, not only can public health awareness be raised, but people can also be encouraged to change unhealthy lifestyle habits and reduce the risk of liver cancer.

In addition, the combination of local media and medical promotion can further expand the coverage of health education. Through various channels such as television, radio, social media, and community activities, prevention knowledge and guidance on healthy lifestyles related to liver cancer can be conveyed to the public, enhancing residents' sense of participation and action. At the same time, regular health lectures, screening activities, and health consultation services can be organized to enhance public awareness of liver cancer prevention and treatment.

For high-risk groups such as hepatitis B virus carriers, long-term drinkers, obese patients, etc., personalized lifestyle intervention plans should be provided. These programs can include dietary adjustments, exercise plans, regular health checkups, etc., to help high-risk populations reduce the probability of disease occurrence (Forner et al., 2006). At the same time, regular effectiveness evaluations should be conducted to monitor the implementation of intervention measures and the improvement of health conditions, in order to adjust the plan in a timely manner and ensure the effectiveness of the intervention. Continuous health education and behavioral intervention can effectively improve the early prevention and management of liver cancer, and ultimately reduce its incidence rate and mortality.

Balanced Allocation of Medical Resources

The study found that among 610 patients with liver cancer, rural residents accounted for a relatively high proportion (93.3%), which may reflect the uneven distribution of medical resources between urban and rural areas. Due to insufficient medical facilities and a lack of professional medical personnel, residents in rural areas face obstacles in early detection and treatment of diseases. This uneven distribution of resources may lead to rural liver cancer patients being diagnosed in the late stage of the disease and missing the best treatment opportunity (Meng et al., 2023).

To improve this situation, it is particularly important to strengthen the investment of medical resources in rural areas. By establishing more primary healthcare institutions and increasing the coverage and frequency of early screening programs for liver cancer, the health awareness and early disease detection rate of rural residents can be effectively enhanced (Hartke et al., 2017). In addition, promoting the use of economical and convenient screening techniques, such as serum alpha fetoprotein testing and liver ultrasound examination, can reduce screening costs, improve accessibility and acceptance of screening (Qin et al., 2024).

In terms of treatment plan selection, this study shows that drug therapy is more common in elderly patients, which may be related to their physical condition not being suitable for surgery. Therefore, providing more treatment options suitable for different patient conditions in rural areas, including surgery, chemotherapy, targeted therapy, and immunotherapy, is the key to improving treatment effectiveness (Singal et al., 2023). At the same time, strengthen the training of grassroots doctors, enhance their understanding and skills in comprehensive treatment of liver cancer, and ensure that patients can receive standardized treatment.

The development of telemedicine technology provides new possibilities for addressing the uneven distribution of medical resources. Through remote medical platforms, patients in rural areas can access expert resources from urban hospitals for remote consultations and treatment guidance, improving the efficiency and quality of medical services (Heckley et al., 2011). In addition, telemedicine can also be used for patient follow-up management, providing support for long-term treatment and disease monitoring (Im et al., 2023).

When implementing medical resource investment and treatment plans, it is necessary to consider the local actual situation, including cultural, economic, and geographical factors. For example, in mountainous areas with inconvenient transportation, mobile medical vehicles can be used to provide doorstep services, or community-based liver cancer screening and health management projects can be established through cooperation with local communities (Zhang, 1989).

Strengthen Basic Research and Data Monitoring

Future research on liver cancer should focus on in-depth exploration of its molecular mechanisms and personalized treatment strategies, especially through large-scale population

cohort studies, to discover more potential risk factors and promote the development of precision medicine. At the same time, a regional liver cancer monitoring database should be established to track disease trends in real time, integrate data such as incidence rate, mortality and treatment effect, and provide scientific basis for public health decision-making. This not only helps with early diagnosis and prevention, but also provides data support for researchers, promoting the scientific and personalized progress of liver cancer prevention and treatment.

Promote Interdisciplinary Collaboration Models

It is crucial to promote the multidisciplinary collaboration (MDT) model in the diagnosis and treatment of liver cancer. Through close collaboration among professional teams such as liver disease experts, oncologists, surgeons, imaging specialists, nutritionists, and psychological counselors, comprehensive and personalized treatment plans can be developed, and patients' conditions can be effectively managed. Liver disease experts provide diagnosis and condition assessment, oncologists develop treatment strategies, surgeons make surgical decisions, imaging experts monitor tumor progression, nutritionists ensure patient nutrition, and psychological counselors provide mental support. The MDT model not only improves treatment efficacy, but also enhances patients' quality of life, promotes knowledge sharing and technological innovation among various disciplines, and advances the comprehensive diagnosis and treatment of liver cancer.

5 Conclusion

This study analyzed the epidemiological characteristics and risk factors of 610 liver cancer patients, and identified middle-aged males, Zhuang ethnic group, and rural residents as the main high-risk groups for liver cancer in the region. Hepatitis B virus infection, previous liver disease history and uneven distribution of medical resources are important factors affecting the incidence rate. The research results show that strengthening early screening and health education for high-risk groups, continuing to promote hepatitis B prevention and control, improving rural medical resource allocation and promoting multidisciplinary cooperation model can effectively reduce the incidence rate of liver cancer and improve the prognosis of patients.

Recommendations

Future research needs to focus on a more comprehensive assessment of risk factors and the long-term efficacy of treatment methods to further optimize prevention and treatment strategies. This study provides important scientific basis for formulating liver cancer prevention and control policies in Guangxi region and also provides reference for liver cancer prevention and control work in other high-risk areas across the country.

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