

Review Paper

Epidemiology of Gallbladder Cancer among North-Eastern States of India: A Review

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Abstract

Worldwide gallbladder cancer (GBC) is a rare neoplasm. The survival rate is poor because of late diagnosis. The incidence of GBC is high among Indian Northeastern states. Systematic search done for review and accepted 24 articles and 2 reports which were published in Pubmed, Google Scholar, medIND and other sources. Four major risk factors found for developing GBC i.e. patients demography, gallbladder abnormalities, patient's exposure, and infections. Studies found that over 70% - 88% GBC reported history of gallstones. GBC hits north-eastern India especially females after Chile, Valdivia. National Population Based Cancer Registry shows that females of Assam represents highest AAR which are noticed in Kamrup Urban District (14.0) followed by Cachar District (10.1), internationally second and third place and nationally first and second. Discussion: The highest incidence found in Assam, Northeast India mainly occupies by the rivers and having different ethnicity, lifestyles, tobacco habits, etc. A study from Cachar District of Northeast India shows that 86.7% women used tobacco those have GBC. Average age of male and female was 54 and 50 years and 71.9% diagnosed in advanced stage. Need more emphasis on epidemiological studies, cancer control programs, and early detection of cancer.

Keywords: Epidemiology, Gallbladder cancer, Gallstone, North-east India, Women.

Introduction

Gallbladder cancer (GBC) has been globally registered in several cancer registries that gallbladder cancer mostly noticed in females. GBC is highly malignant with a poor survival rate¹. As per oncologists the disease spreads rapidly because gallbladder is an adjacent organ of liver. So, the diagnosis of gallbladder cancer mostly found in advanced stages.

Signs and symptoms of GBC are not specific and often appear late in the clinical course of the disease and due to this the diagnosis is generally made when the cancer in advanced stage, and prognosis for survival is less than 5 years in 90% of cases². The incidence of gallbladder cancer is low compared with other sites, even among populations who are at highest risk, and accounts for about 1% of all cancer deaths. It has been reported that during 2008, the incident cases of gallbladder cancer at the global level were 145,662 with an age-standardized rate (ASR) of 2.0 per 100000 persons³. A study noticed that very high GBC incidences were among the American-Indian and Chilean-Mapuche populations, as well as in the Northern India². Among North Eastern India is the leading cancer sites are Oesophagus, Stomach, Lung, Hypopharynx, Nasopharynx, Larynx, Tongue, Gallbladder, Thyroid and this may be due to genetic, life style, food habits or other factor associated with it⁴.

Up to 1980s, the North Indian cancer centres reported several experiences on gallbladder cancer^{5,6}. Most of the places of

North India and North-eastern states of India are surrounded by the rivers and lifestyle is quite different. Several studies suggested the lifestyle habits such as tobacco use are very common in north-eastern region of India. The region mostly occupied with different ethnic groups with different cultures and it is obvious that their day to day lifestyle is unique from rest of the country.

Materials and Methods

To attempt this study the authors have gone through several journals, reports from the year 1975 to 2014. Articles on related topic on "Epidemiology and risk factor of gallbladder cancer", "Gallbladder cancer in the world", "Gallbladder cancer in India and North-east India" which were published in Pubmed, Google-scholar, medIND, and other sources were carefully reviewed. The authors consulted 45 articles and 4 reports and to cover major aspects of this study the author accepted only 22 references.

Results and Discussion

Risk factors of gallbladder cancer: Till now several risk factors of gallbladder cancer noticed which are highlighted in Figure-1. The risk factors for gallbladder cancer are divided into four broad categories i. patients demography, ii. gallbladder abnormalities, iii. patients exposures, and iv. infections⁷⁻⁹. In India, Calcutta Medical Research Institute conducted 8 years

prospective study on gall stones and its association of gallbladder cancer. Findings from 198 gallbladder cancer cases 86% patients have gallstones. Male and female sex ratio was 1:3 and GBC were common in elderly women¹⁰. Other studies observed that gallstones were common in gallbladder cancer, where a study shows 88%¹¹ and another shows 70%¹². Infection is another cause of GBC. There is an association found in Helicobacter infection of the bile¹³ and factors like Liver flukes¹⁴ are also responsible for GBC. Genetic mutations are another factor of gallbladder cancer. A study shows 1281 genetic mutations in gallbladder cancer¹⁵. Moreover the other risk factors for GBC are fried foods, tobacco use, a long interval between the meals, chemical exposure, and family history of gallstone disease¹⁶.

Epidemiology of gallbladder cancer in North-East India: GLOBOCAN in 2012, estimates new gallbladder cancer for all ages in males and females were 76,844 and 101257, which constitutes males and females from India as 7,615 and 11,172¹⁷. As per data it has estimates that GBC burden in 2025, where India will alone represent 9.76% males and 11.15% females.

National Cancer Registry Program under Indian Council of Medical Research has published three years report of Population Based Cancer Registries (PBCRs) from 2009 to 2011¹⁸ shows (Table-1) international comparison of Age Adjusted Rate (AAR) with that of PBCRs in India. The result shows that a Kamrup Urban District (Assam, North-East India with AAR 14.0) female occupies second position worldwide after Chile, Valdivia (AAR 27.3). Cachar district (Assam, North-East India with AAR 10.1) followed Kamrup Urban District and occupies third position. Among first top 10 lists of International comparisons shows that 5 Indian PBCRs occupied their place and among them 4 PBCRs were from North-Eastern States of India (3 PBCRs from Assam and 1 PBCr from Manipur District). And among males the Kamrup Urban District (AAR 7.4) occupies fourth position following Valdivia (Chile), Daegu (Korea), and Ulsan (Korea) respectively followed by Cachar district (AAR 5.1) which was counted for sixth position. The publication also focus national attention (Table-2) that among males out of 10 PBCRs 7 PBCRs were from north-eastern regions and similarly females too occupies 7/10 PBCRs. In India the highest AAR of males was 7.4 which were registered from Kamrup Urban District followed by Cachar district 5.1 and Delhi 4.2. In the case of females the highest AAR registered from Kamrup Urban District 14.0 followed by Cachar district and Delhi with AAR 10.1 and 9.2 respectively.

A hospital based cancer registry from Cachar Cancer Hospital & Research Centre, Assam published data in the year 2014, that a total 586 females cancer were registered from Barak Valley and the common primary cancer sites were gallbladder followed by breast, cervix, and oesophagus and shows that GBC had 86.7% tobacco users¹⁹. The incidence of GBC in females is remarkably high in the state of Assam. This part of the world is considered as high risk area for GBC²⁰. From January 2011 to December

2012 a study conducted with 837 gallbladder cancer in regional cancer centre, BBCI, Assam and concluded that 70% patients were females. The median age for males and females were 54 and 50. 81.1% patients were from rural areas and 71.9% patients were registered in advanced stage group of IV²¹.

Discussion: As per GLOBOCAN report published in 2012 shows that estimation of 2025 that India will alone represents around 10% of the world's population. So, the picture of GBC in India will be considered seriously. Though studies suggested gallbladder cancer is a rare neoplasm but it is not considered as a rare neoplasm in the context of north and North-east India. NCRP, 2013 reports that AAR of gallbladder cancer for females' was 14.0 is the second most common disease in North eastern registry after Chile, Valdivia. Among the top 10 registries of India north eastern states occupies a total 7 positions in cases of males and females. A high prevalence of GBC reported in Gangetic region²². Kamrup Urban District and Cachar district of Assam (Northeast India) occupies by the river Brahmaputra and Barak respectively. Indian PBCr under National Cancer Registry Program shows the incidence of GBC is quite high in river valleys (Delhi and North-eastern states) compare to sea valleys (Chennai and Mumbai). From these data conclusion may be drawn that the incidence is comparable due to the food habits of people in river valleys v/s sea valleys. Northeastern states have different ethnicity and lifestyles, food habits are different from the rest of the country. For developing GBC several factors are responsible like patient's demography, gallbladder abnormalities, patient's exposures, and infections. Several studies suggested that there is a close association between gallstones and gallbladder cancer and presence of gallstones predominantly high risk factors for developing GBC. Women are more vulnerable group in Northeastern states of India and have huge tobacco habits. Studies revealed an average age for GBC in males 54 years and in females 50 years and majority of diagnosis done takes place in an advanced stage. Advanced stages of cancer have less prognosis and survival.

Conclusion

This review study concludes that North-eastern states have high incidence of gallbladder cancer especially in Assam and majority of patients are female. Northeastern states of India have different ethnicity and lifestyles, food-habits, tobacco consumption from rest of the country. So, gallbladder cancer have serious impact in North-eastern states and should consider as epidemic and need to initiate more epidemiological studies and need cancer control preventive measures like tobacco control programs and early detection of cancer through screening programs.

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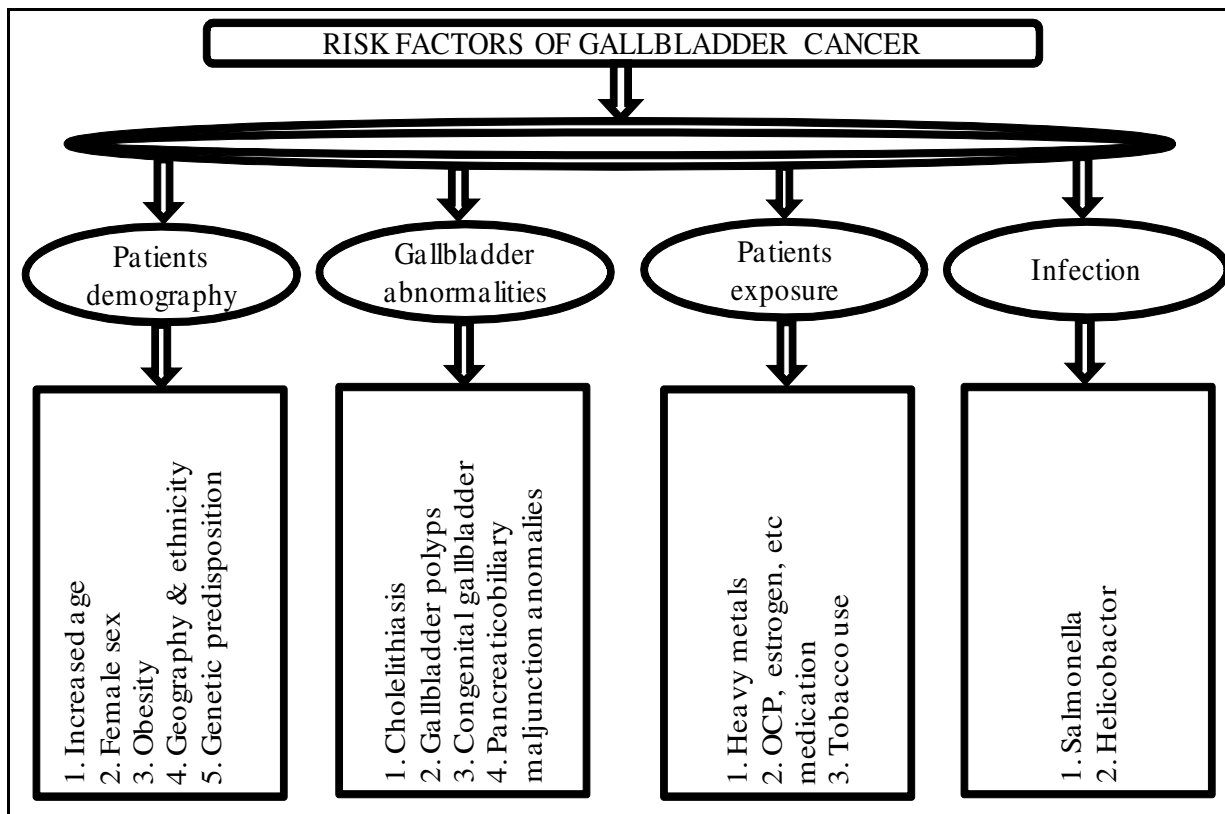


Figure-1
 Risk factors of developing gallbladder cancer⁷⁻⁹

Table-1
 International comparison of AAR with Indian PBCRs

International Comparisons	Males (AAR)	International Comparisons	Females (AAR)
Chile, Valdivia	12.3	Chile, Valdivia	27.3
Korea, Daegu	10.4	Kamrup Urban District	14.0**
Korea, Ulsan	10.1	Cachar District	10.1**
Kamrup Urban District	7.4**	Algeria, Setif	10.0
USA, Cali., LA County: Korean	5.9	Delhi	9.2*
Cachar District	5.1**	India, New Delhi	8.6
Ecuador, Quito	4.5	Korea, Jejudo	8.0
Czech Republic	4.4	Dibrugarh District	7.7**
Delhi	4.2*	Peru, Trujillo	7.5
Italy Vaerse Province	4.1	Imphal West District	7.3**

* Indian states under NCRP (ICMR) ** North-eastern states under NCRP (ICMR).

Table-2
National comparison of AAR from Indian PBCRs

National Comparison	Males (AAR)	National Comparison	Females (AAR)
Kamrup Urban District	7.4*	Kamrup Urban District	14.0*
Cachar District	5.1*	Cachar District	10.1*
Delhi	4.2	Delhi	9.2
Aizawl District	3.6*	Dibrugarh District	7.7*
Imphal West District	3.6*	Imphal West District	7.3*
Bhopal	3.3	Sikkim State	7.0*
Dibrugarh District	3.2*	Kolkata	5.6
Kolkata	2.5	Tripura State	5.4*
Mizoram State (MZ)	2.4*	Aizawl District	5.3*
Tripura State	2.1*	Bhopal	4.9

*North-eastern states

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