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 is 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 cancer5,6. 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. infections7,8. 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 women\textsuperscript{10}. Other studies
observed that gallstones were common in gallbladder cancer,
where a study shows 88\%\textsuperscript{11} and another shows 70\%
\textsuperscript{12}. Infection is another cause of GBC. There is an association found in
Helicobacter infection of the bile\textsuperscript{13} and factors like Liver
flukes\textsuperscript{14} are also responsible for GBC. Genetic mutations are
another factor of gallbladder cancer. A study shows 1281
genetic mutations in gallbladder cancer\textsuperscript{15}. 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 disease\textsuperscript{16}.

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 11,172\textsuperscript{17}.
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 2011\textsuperscript{18} 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 users\textsuperscript{19}. 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 GBC\textsuperscript{20}. 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 IV\textsuperscript{21}.

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
was14.0 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 region\textsuperscript{22}. 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.

Acknowledgement

I would like to acknowledge the NCRP under ICMR for their
resourceful publications. I also acknowledge the North Eastern
Cancer Registries for their participation in NCRP (ICMR).
Figure-1

Risk factors of developing gallbladder cancer

Table-1

International comparison of AAR with Indian PBCRs

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

* Indian states under NCRP (ICMR) ** North-eastern states under NCRP (ICMR).
Table 2
National comparison of AAR from Indian PBCRs

<table>
<thead>
<tr>
<th>National Comparison</th>
<th>Males (AAR)</th>
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<th>Females (AAR)</th>
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<td>Kamrup Urban District</td>
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<td>Cachar District</td>
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<td>10.1*</td>
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<td>Delhi</td>
<td>4.2</td>
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<td>9.2</td>
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<td>Aizawl District</td>
<td>3.6*</td>
<td>Dibrugarh District</td>
<td>7.7*</td>
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<tr>
<td>Imphal West District</td>
<td>3.6*</td>
<td>Imphal West District</td>
<td>7.3*</td>
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<tr>
<td>Bhopal</td>
<td>3.3</td>
<td>Sikkim State</td>
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<tr>
<td>Dibrugarh District</td>
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<td>5.6</td>
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<td>Tripura State</td>
<td>5.4*</td>
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<tr>
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<td>5.3*</td>
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<tr>
<td>Tripura State</td>
<td>2.1*</td>
<td>Bhopal</td>
<td>4.9</td>
</tr>
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</table>

*North-eastern states

References


