

RESEARCH COMMUNICATION

Prevalence of Tobacco Use and Tobacco-dependent Cancers in Males in the Rural Cancer Registry Population at Barshi, India

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Abstract

Background: In the Rural Cancer Registry at Barshi (western Maharashtra, India), it has been found that the incidence of cancer is relatively low. **Aim:** To explain the low incidence of tobacco related cancers in males on the basis of prevalence of their tobacco habits. **Setting and Design:** Simple random sample of villages from Barshi Rural Cancer Registry. **Material and Methods:** A tobacco survey was carried out in 5,319 adult males. Site specific incidence data for Barshi and Mumbai Cancer Registries were available from published reports in the National Cancer Registry Programme. Published report of prevalence of tobacco habits in Mumbai males was available. **Results:** The tobacco survey showed that the prevalence of smoking compared to Mumbai was low (9.9% vs 23.6%) and the incidence of smoking dependent cancers viz., cancers of oropharynx, larynx and lung were significantly low ($P < 0.05$). However, although the proportion of tobacco chewers is higher in Barshi compared to Mumbai, the incidence rates for cancer of hypopharynx and oral cancer which are predominantly chewing dependent did not show higher rate than in Mumbai. **Conclusions:** The low incidence of smoking dependent cancers in males can be explained by the low prevalence of smoking habit but further studies are needed to explain the observed incidence of predominantly chewing dependent cancers.

Key Words: Tobacco - lifestyle - cancer incidence

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Introduction

A rural Cancer Registry was set up by the Indian Council of Medical Research under its National Cancer Registries Project (NCRP) in 1987 at Barshi in western Maharashtra. The Registry covers a population of over 0.4 million from three sub-districts, viz., Barshi in Solapur district, Paranda and Bhum in Osmanabad district. An innovative methodology in which cases were registered by interacting with the community was adopted to overcome the prevailing obstacles for cancer registration in rural areas like lack of cancer awareness, paucity of accessible medical centres etc. and was found to be successful.

Over the years the age adjusted incidence rates for all cancers varied from 43.8 to 57.6 per 100,000 in males (Indian Council of Medical Research, 1992; 2006). A comparative study of incidence rates for cancer at all sites in males during early nineties in various parts of Maharashtra showed that the Barshi rates were low (AAR = 46.2 per 100,000 vs 99.3 to 115.4 per 100,000 in other registries in Maharashtra viz., Mumbai, Pune and Nagpur

(Indian Cancer Society Report, 2002; 2003; Indian Council of Medical Research, 2006).

This paper tries to explain the low rates of cancer incidence in males in the Barshi Registry on the basis of prevalent tobacco habit patterns and also examines whether there has been any change in the tobacco habit pattern over a decade.

Materials and Methods

A tobacco survey was undertaken in 1995 in a simple random sample of villages from each of the three tehsils covering three percent of the population. The total population of 9 villages drawn in the sample was 14,563. House to house visits in the sampled villages were undertaken to enrol the population. Those above 14 years were 5,319 males. More than 80% of these were interviewed for their tobacco habits as per a pre-designed pro-forma provided by NCRP. A similar sample survey was carried out in 2004-05 to study changes, if any, in the habit profile. The number of adult males interviewed was 5,580 (84%) out of 6,673 who were enrolled.

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Table 1. Prevalence of Tobacco Habits in 1995 and 2005

Category	1995		2005		
	Number	%	Number	%	
Smoking only	Bidi	58	1.3	54	1.0
	Cigarette	20	0.5	50	0.9
	Bidi+Cigarette	2	0.05	2	0.04
	Total	80	1.8	106	1.9
Chewing only	Tobacco	1,937	44.2	2,452	43.9
	Mishri	23	0.5	16	0.3
	Tobacco+Mishri	126	2.9	52	0.9
Total	2,086	47.6	2,520	45.2	
Smoking+Chewing*	179	4.1	203	3.6	
Non users	2,039	46.5	2,751	49.3	
Total	4,384	100.0	5580	100.0	

*Chillum, Clay pipe, hooka & others included

The usual statistical tests of significance (Chi square, Z) and for comparison of age standardized rates the method given by Smith (1992) were used.

Results

The habit patterns prevailing in 1995 and 2005 are shown in Table 1. It shows that, even when we consider all types of smokers (viz., bidi, cigarette, chillum, and hookah including those with dual habit of smoking and chewing tobacco), the percentage of smokers in males is barely six percent. The proportion of all tobacco chewers is around 50%. Mishri use does not seem to be very popular among the males. Over 46% in males are nonusers of tobacco, mean age of addiction for male smokers is 27.2 and for chewers 22.8 years in the earlier survey and the corresponding ages for the later survey were 32.0 and 25.3, respectively.

It is well known that tobacco use is a risk factor for cancer at several sites. If we consider cancer sites classified as upper gastro intestinal tract cancers, they fall into three groups based on risk in smokers and chewers.

1. Those in which smokers have a higher risk than chewers: cancer of the oropharynx and larynx with risk of 11.8 and 7.7 respectively.

2. Those in which chewers have a higher risk: cancers of oral cavity and hypopharynx with risks of 6.0 and 6.2 respectively.

3. Cancer of oesophagus in which chewers and smokers have about equal risk, 2.5 and 2.2 respectively, (Jussawalla and Deshpande, 1971) additionally it has also been reported that smoking is a risk factor for lung cancer (Notani and Sanghvi, 1974).

Comparing the incidence of tobacco dependent cancer sites (TDC) (referred to above) in Barshi registry with those in other registries in Maharashtra showed that Barshi had low incidence at each of these sites (Table 2). Comparing the prevalence of tobacco habits in Barshi Registry population with that in areas of high oral cancer incidence rates shows that in males the prevalence of tobacco chewing at 51.7% is not so low in Barshi compared to that reported (11% to 55%) in areas where oral cancer incidence is high whereas the prevalence of smoking is indeed low (5.9 % vs 8%-77%) (Wahi, 1968; Gupta, 1989). However, it would be of greater interest to

Table 2. Incidence Rates for Tobacco Dependent Cancers in Various Registries in Maharashtra

Sites	Barshi 1990-96	Mumbai 1990-96	Pune 1996-00	Nagpur 1995-99
Oral*	15.9	31.0	24.8	30.5
Larynx	2.3	6.9	7.4	9.3
Lung	1.6	12.0	6.9	7.3

*Oral cavity, pharynx and oesophagus (excluding nasopharynx)

Table 3. Comparison of Barshi and Mumbai for Smoking Dependent Cancers and Smokers

Site	Barshi	Mumbai	P-value
Oropharynx*	0.8	3.5	<0.05
Larynx*	2.5	8.2	<0.05
Lung*	1.3	14.5	<0.05
Proportion of Smokers	9.9%	23.6%	<0.05

*Age adjusted rates/100,000

Table 4. Comparison of Barshi and Mumbai for Chewing Dependent Cancers and Tobacco Users

Site	Barshi	Mumbai	P-value
Oral cavity*	6.4	13.1	<0.05
Hypopharynx*	6.7	8.3	-NS-
Esophagus*	5.8	10.8	<0.05
Proportion of Tobacco Users (%)			
Chewers	72.0	55.6	<0.05
All form of tobacco use	75.0	69.3	<0.05
Chewing only	65.1	45.7	<0.05
Smoking only	3.0	13.7	<0.05
Smoking & Chewing	6.9	9.9	<0.05

*Age adjusted rate/100,000

compare the incidence of TDC in Barshi to another population where data on both tobacco prevalence and cancer incidence are available.

Data of this type are available for Mumbai, but the prevalence of tobacco habits is given only for those above 35 years (Gupta, 1996). The age adjusted rates for smoking dependent cancers for Barshi and Mumbai for the period 1988-92 are given in Table 3 (see Parkin et al., 1997), along with the proportion of smokers (in those above 35 years). Proportion of smokers in Barshi is significantly lower than in Bombay (P<0.05) and so also the incidence rate for cancers of oropharynx (P<0.05) larynx (P<0.05) and lung (P<0.05). A similar analysis was carried out for chewers (Table 4).

Proportion of chewers is higher in Barshi compared to that in Mumbai. Although no significant difference is found in incidence of hypopharyngeal cancer which is mostly chewing dependent, it is difficult to explain the lower incidence of oral cancer in Barshi. Incidence of cancer of oesophagus is also low in Barshi. As we have seen for cancer of oesophagus not only smoking and chewing are equal risk factors but it is also shown that the etiologic fraction due to smoking and chewing is only 50% showing there by that there are other factor/factors play an equal role in the etiology of cancer at this site (Jayant et al., 1977).

Study of changes, if any, in the tobacco habit profile in the population, after a decade showed that there was

no difference in the percentage of smokers (5.5% in 2005 vs 5.9% in 1995, $P=0.43$) whereas there was a significant reduction in the proportion of chewers (48.8% in 2005 vs 51.7% in 1995, $P<0.05$). The age of addiction was significantly higher in the later study compared to the earlier one (25.3 yrs vs 22.6 yrs, $P<0.001$) for chewing only and (32.1 yrs vs 28.6 yrs, $P=0.05$) for smoking only.

Discussion

In a rural population where cancer awareness is lacking and where the patients reach medical facilities in an advanced stage due to financial constraints and even die before a diagnosis is arrived at, we need to examine whether the low incidence is due to under-registration by the registry. We have looked into this problem by conducting house to house sample surveys for case finding at the end of each year. Our studies indicate that the Registry has not missed any diagnosed case but the possibility of having missed a case having died before diagnosis can not be ruled out particularly because deaths in rural areas are not medically certified and cause of death is not given. However we have cancer detection clinics twice a year for a group of villages (with about 30000 population) and our investigators interact with the community on a regular basis and motivate all symptomatics to visit the clinic and also to collect information on deaths. Therefore, it is unlikely that we would have missed any significant number of cases. Thus it can be said that the low incidence of smoking dependant cancers are truly due to low prevalence of smoking. However it is harder to explain the low incidence of cancer of the oral cavity. To explain this it is necessary to study the ingredients used in chewing, duration of quid being kept in the mouth etc. The local clinicians do feel whatever the type of chewing in Barshi it does seem to have lower risk than in , say, Mainpuri.

It is encouraging to note that in the following decade after 1995, the proportion of smokers has not increased and the proportion of chewers has gone down. The age of addiction has also moved upwards. These observations show that tobacco will not be a major risk factor in Barshi in the coming years. As smoking is not yet highly prevalent in the area, it would be desirable to mount an anti smoking programme targeting the youngsters so that they do not fall prey to the habit in the future. The current anti-smoking programmes of the Government of India would also help in having a non-smoking generation. However, alcohol consumption is on the rise and future studies and control programmes need to address this problem.

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