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Original Article

Recent trends in new case detection rates in leprosy by age and sex in Gudiyatham Taluk, Tamil Nadu, India

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In the race towards eradication of leprosy, the emphasis has shifted from prevalence to new case detection rates which are proxy for true incidence rates. There is great need for reliable data on new case detection rates over time, classified by age and sex. In this paper, the trend of age specific and sex specific new cases detection rates, from 2001 to 2009, for the field area of Schieffelin Institute of Health-Research and Leprosy Centre are presented and implications discussed. The appropriate age distribution of Census of India 2001 was used to estimate the age distribution of the area. Three year moving averages were computed for age specific rates. The age group 55+ had the highest rate among all age groups from 2002 to 2006 and afterwards declined a little. The rates of ages 15-34 and 35-54 were high and their patterns over 2002 to 2008 were the same. The specific rates of children (0-14) were declining generally through 2002 to 2008. The specific rates of males were slightly higher than the females all through 2001 to 2009 but the difference between male and female rates was not significant at any year (P>0.05).

Key words: Age specific rates, Sex specific rates, Leprosy, Karigiri

Introduction

In the race towards eradication of leprosy, the emphasis of the Government of India has shifted from prevalence to new cases detection rates (Joshi et al 2007, Directorate General of Health Services 2009). The new case detection rates are a proxy for true incidence rates which are difficult to measure for a chronic, incipient disease such as leprosy (Smith 1997). Several articles have reported the recent new case detection rates in different parts of India and the world (Cunha et al 2001, Gupte et al 2006, Rao 2006, Subramanian et al 2006, Kumar et al 2007, WHO 2009). Most of them present total rates and specifically by age and sex which are important to target vulnerable sections of the population.

Early articles from Gudiyatham Taluk in Tamil Nadu, one of the hyperendemic geographical areas in India during the pre-MDT era have identified specific ages which are more vulnerable especially children (Rao et al 1972, 1975). Later articles have only cited household transmission rates by age and sex or simply the new case detections over time (Rao et al 1989).

Age specific new cases detection rates and gender specific new cases detection rates are important

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indices of leprosy epidemiology (Cunha et al 2001, Norman et al 2006). These rates are not presented in many studies describing epidemiology of leprosy because of the difficulty of getting appropriate population estimation by age group. In the absence of these rates, percentages using numbers in numerators are recommended and used (Joshi et al 2007). For example, in the place of age specific rate for the age group 0-14, percentage of children to total cases has been used, also in the place of female-gender specific rates; percentage of females out of total cases has been used. These can be used as proxy measures to the specific rates. They can never be substitutes of the actual specific rates.

A few publications have documented the population based specific rates and drawn inferences (De Vries and Perry 1985, Wu et al 2000, Cunha et al 2001, Subramanian et al 2006, Kumar et al 2007). Norman et al (2006) while describing the trend in leprosy from 1955 to 2005 in Gudiyatham Taluk, Vellore district presented the proportions such as percentage of child to adult cases and also percentage of female to male cases and drawn inferences. There is great need for reliable data on NCDRs over time, classified by sex and age. In this paper, the recent trend of age specific and gender specific new cases detection rates from 2001 to 2009 for the same area are presented, inferences drawn and their implications discussed.

Materials and Methods

Gudiyatham Taluk is located in the Vellore district of Tamil Nadu, India. It is the field practice and research area of the Schieffelin Institute of Health Research and Leprosy Centre (formerly SLRTC) at Karigiri and has carried out extensive leprosy services and research, mainly in this area. As early as the late fifties, it was decided to establish a computerized leprosy data bank, recording the details of every newly detected case of leprosy and the follow up. Such records are maintained from 1955 to date. Every new case was initially screened by the paramedical workers, body charts drawn, bacterial index determined and the diagnosis and classification medically confirmed. Details of age and history of leprosy were carefully ascertained and verified by family members. Details of population covered and methods of collection of data in this control area were described by Norman et al (2004, 2006).

The age distribution of population of rural Vellore district, given by the census of India 2001 (Census of India 2001), was used to estimate the age and sex distribution of the control area. These provided the denominators for calculation of specific rates, expressed per 10,000 population. In order to smooth the annual age specific new cases detection rates, three year moving averages were computed.

Results

Age specific new cases detection rates, for four broad age groups, for the years 2002 to 2008 are given in Figure 1. All specific rates were high in 2002, declined to the lowest level in the year 2004 nearer to the year in which leprosy was declared eliminated as a public health problem, although the declaration was not based on the new cases detection rate. The age group 55+ had the highest rate among all age groups from 2002 to 2006 and afterwards declined a little. The pattern of the rates over 2002 to 2008 was the same for the age groups 15-34 and 35-54. The age specific rates of the children declined, in general, all through 2002 to 2008 after being high in 2002. It was 1.53 per 10,000 population in 2002 dipped fast to 0.64 in 2004 and continued declining and reached 0.28 per 10,000 population in 2008.

Gender specific new case detection rates for the years 2001 to 2009 given in Figure 2 showed a slight decreasing trend over the whole period. The difference between the rates of males and females was the highest in 2002; gradually declined and reached the lowest in 2009. The rates of males were slightly higher than the females all through but the difference between

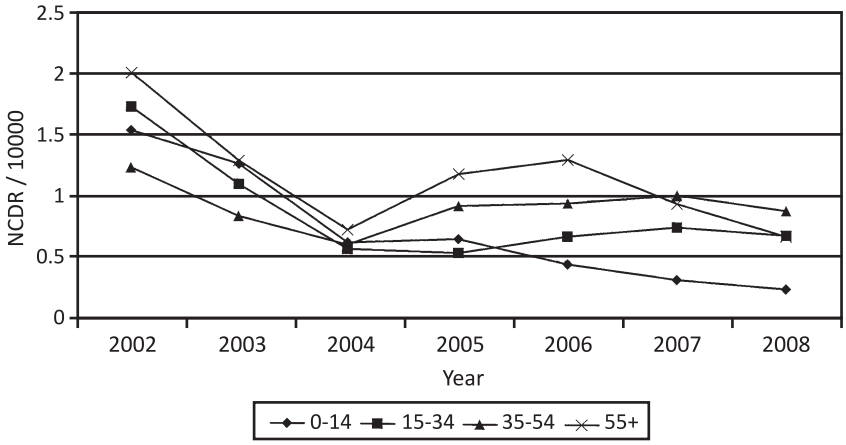

Figure 1 : Age specific new case detection rate (three year moving average).

Figure 2 : Gender specific new case detection rate (2001-2009).

male and female rates did not attain statistical significance at any year ($p>0.05$).

Discussion

All the age specific rates were high in the beginning of the study period and then showed a declining trend. Although the same methodologies were continued for detection of new cases for all years, after 1997, the year of integration of leprosy services with general health services, for two years, 1998 and 1999; no active case detection services in the field through various surveys were undertaken and from 2001 onwards school survey and contact surveys were restarted. Perhaps, the cases accumulated over the past years were detected in 2001. This may be the reason for higher rates in the beginning. May be, for the first time in the country that once an endemic area is showing new case detection rate below 1.

Child specific rate has epidemiological significance, a high rate may indicate continuing transmission of the disease in the community. A case detected among children provides an opportunity to detect the index case usually within the family (Norman et al 2004). It is interesting to note that the child specific rate has been coming down. Quite striking is the observation in the age group 0-14 where the rate has dropped below 0.5. This is in spite of active case detection measures such as school surveys, contact survey and ring survey.

Compared to all other ages, the specific rates among the older persons, 55+ were the highest over the period generally. This may be due to tracing of the index cases of the child cases or due to immigration of cases from other areas or both. Asilian et al (2005) reported that in the Province of Isfahan of Iran, all new cases were found to be migrants from outside. Chakraborthy et al (2006) discussed about the way of life of the leprosy cases who commute daily and migrate for their livelihood. This was also one of the reasons for irregularity of treatment. Rao et al (2000) reported possibility of leprosy affected beggars as a hidden source for transmission of leprosy. Chudasama et al (2007) attributed the increase in the leprosy cases in Surat district to migration. These suggest that migration has a part in contributing to new cases, and defaulting treatment and thereby or otherwise transmitting leprosy. This aspect should be investigated thoroughly and suitable remedies should be found. Moreover, the trends in all three adult groups depend on the levels of awareness for self-reporting, so caution must be exercised regarding interpretation as there was undiagnosed disease burden as shown in other studies.

The gender specific new case detection rates showing higher level for males than females is a universal phenomenon reported in many field-based and hospital-based studies (Arora et al 2008). Such a phenomenon was attributed not only to social, economic, behavioural (Peters and Eshiet 2002) (health seeking behaviour) and biological (Jakeman et al 1995) reasons but also to operational factors such as male preponderance of field staff (Norman et al 2006). In the current study, the rates narrow down to equality at the end of the study period. Moreover, none of the differences between male and female rates was statistically significant implying equality of the rates. Continuing the observations for a few more years may be necessary to ascertain if the equality holds.

When there are more adult new cases, in addition to provision of medical care, it is necessary to facilitate self-care programmes to prevent dehabilitation (Chakraborthy et al 2006, Madhavan et al 2007). There seems to be an association between poverty and leprosy (Lockwood 2004, Kerr-Pontes et al 2004). Souza et al (2009) described measures towards leprosy eradication in Brazil with a focus on improving housing conditions, sanitation and education of the population. The concept of 'care after cure' included programmes for poverty alleviation and economic empowerment (Jesudasan and Rao 1996). Such measures may accelerate reaching the common goal of a world without leprosy in addition to those mentioned by Pannikar (2009) in 'Global strategy for further reducing the disease burden due to leprosy: 2011-2015'.

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