## Commentary

## Socio-economic dynamics of asthma

Asthma is a complex, chronic inflammatory disease of the lower airways affecting people of all ages. Approximately 300 million individuals are currently suffering from asthma worldwide and 10 per cent of it *i.e.* 30 million in India. The prevalence of asthma is estimated to range from 3 to 38 per cent in children and from 2 to 12 per cent in adults<sup>1</sup>. The disease causes lost school and work days, limitations in daily activities, and sleep disturbances. Lung function impairment also occurs, resulting in decreased quality of life unless disease control is achieved and a high annual financial burden is incurred. Achievement and maintenance of control through assessment of clinical manifestations and future risk has become the aim of treatment over the years<sup>1</sup>. About 15 million disability-adjusted life years are lost annually due to asthma; asthma, therefore, represents 1 per cent of the total global disease burden<sup>2</sup>. The annual death rate due to asthma is estimated to be 250,000 and the majority of deaths occur in low and middle income countries<sup>3</sup>. Patients from low- and middleincome countries have more severe symptoms than those in high-income countries, possibly due to incorrect diagnoses, poor access to health care, the unaffordability of therapy, exposure to environmental irritants, and genetic susceptibility to more severe disease<sup>4</sup>. The apparent racial and ethnic differences in the prevalence of asthma reflect underline genetic variances with a significant overlay of socioeconomic and environmental factors. Asthma found in higher prevalence in developed than in developing nations, in poor compared to affluent population in developed nations and in affluent compared to poor population in developing nations-reflect lifestyle differences such as exposure to the allergens, access to health care.  $etc^5$ .

The socio-economic status (SES) is an important determinant of health and nutritional status as well as of mortality and morbidity. SES also influences the accessibility, affordability, acceptability and actual utilization of various available health facilities<sup>6</sup>. There have been several researches conducted to establish the relationship between the health related problems and SES. The article by Davoodi and colleagues is a presentation of association between SES and family history of asthma in Mysore, India, Researcher observed prevalence of having any family history of asthma 88.2 per cent in high class group, 79.4 per cent in upper middle class, 60 per cent in lower middle class and 40 per cent in the low class group by adopting Agarwal's classification and concluded that high SES is risk factor for developing asthma<sup>7</sup>. This study conducted in the limited population and used income per capita based Agarwal's classification for SES. Asthma was diagnosed in 2.28, 1.69, 2.05 and 3.47 per cent respondents respectively at Chandigarh, Delhi, Kanpur and Bangalore, with overall prevalence of 2.38 per cent by the Asthma Epidemiology Study Group. Female sex, advancing age, usual residence in urban area, lower SES, history suggestive of atopy, history of asthma in a first degree relative, and all forms of tobacco smoking were associated with significantly higher odds of having asthma<sup>8</sup>.

Socioeconomic status in childhood had no significant impact on the prevalence of asthma in the New Zealand born cohort study<sup>9</sup>. Generalization of these results to other societies should be done with caution, but our results suggest that the previously reported associations may be due to confounding. SES indirectly affects asthma symptoms at preschool age. The inverse association between SES and asthma symptoms emerges at age 3 yr. This is particularly due to a high level of adverse prenatal circumstances

in low-SES toddlers. Future research should evaluate public health programs (during pregnancy) to reduce socioeconomic inequalities in childhood asthma<sup>10</sup>. Lower educational level was associated with increased risk of prevalent and incident chronic bronchitis and asthma with no atopy. Lower socioeconomic groups tended to have a higher prevalence and incidence of asthma, particularly higher mean asthma scores. Adjustment for variables associated with asthma and bronchitis explained little of the observed health differences by SES<sup>11</sup>. Lower SES was associated with worse asthma control, greater emergency health service use and worse asthma self-efficacy. Lower SES was not related to worse asthma-related quality of life in Canada<sup>12</sup>.

The diagnosis and treatment of asthma is, of course, a very sensitive issue. New researches are helping us to learn different risk factors of asthma. There have been a limited number of investigations on this issue in India in the past. Most such reports reveal marked deficiencies in knowledge and inadequacies in treatment practices of asthma amongst general practitioners<sup>13</sup>. It also accounts for high disease related morbidity measured on indices such as the school or work absenteeism, emergency-room visits and hospitalization. Asthma is one of the most common diseases confronted not only by the physicians and pediatricians, but also by primary care physicians and general medical practitioners<sup>14</sup>.

The relation between SES and asthma is complex. Studies vary with respect to whether low socioeconomic status is associated with an increased risk<sup>15</sup>, reduced risk<sup>16</sup>, or not associated<sup>9</sup> with asthma. Because of multiple indicators for SES, there is no uniform definition of SES across studies. Although some researchers use individual or family indicators (*i.e.* household income, level of educational attainment, insurance status), others use community indicators (i.e. percentage of residents living below the federal poverty level). Most of the available intervention to improve asthma outcomes target individual patients. However, innovations in asthma care are most likely to be adopted by individuals who have the means and feel empowered to do so<sup>17</sup>. Lack of social support is a salient characteristic of urban, low income patients with asthma and other chronic diseases. There is strong evidence of a relationship between social support and asthma self-management<sup>18</sup>. Therefore, the contextual influences should be considered when formulating asthma self-management plans with patients from socioeconomically disadvantaged communities.

## Surya Kant Department of Pulmonary Medicine King George's Medical University, U.P. Lucknow 226 003, India dr.kantskt@rediffmail.com

## References

- Cavkaytar O, Sekerel BE. Baseline management of asthma control. *Allergol Immunopathol* (Madr) 2012 pii: S0301-0546.
- Masoli M, Fabian D, Holt S, Beasley R. for the Global Initiative for Asthma (GINA) Program, The global burden of asthma: executive summary of the GINA Dissemination Committee report. *Allergy* 2004; *59* : 469-78.
- Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention. Updated 2011. Available from: www.ginasthma.org/ uploads/users/files/GINA Report 2011.pdf, accessed on February 2, 2013.
- Lalloo UG, Walters RD, Adachi M, de Guia T, Emelyanov A, Fritscher CC, et al. Asthma programmes in diverse regions of the world: challenges, successes and lessons learnt. Int J Tuberc Lung Dis 2011; 15 : 1574-87.
- Global Strategy for Asthma Management and Prevention (updated 2012). Available from: http://www.ginasthma. org/guidelines-gina-report-global-strategy-for-asthma.html, accessed on February 2, 2013.
- Agarwal AK. Social classification: The need to update in the present scenario. *Indian J Community Med* 2008; 33: 50-1.
- Davoodi P, Mahesh PA, Holla AD, Ramachandra NB. Association of socio-economic status with family history in adult patients with asthma. *Indian J Med Res* 2013; *138*: 493-503.
- Aggarwal AN, Chaudhry K, Chhabra SK, D'Souza GA, Gupta D, Jindal SK, *et al.* Prevalence and risk factors for bronchial asthma in Indian adults: A multicentre study. *Indian J Chest Dis Allied Sci* 2006; 48 : 13-22.
- Hancox RJ, Milne BJ, Taylor DR, Greene JM, Cowan JO, Flannery EH, *et al.* Relationship between socioeconomic status and asthma: a longitudinal cohort study. *Thorax* 2004; 59: 376-80.
- Groen EH, Rossem LV, de Jongste JC, Mohangoo AD, Moll HA, Joddoe VW, *et al.* The role of prenatal, perinatal and postnatal factors in the explanation of socioeconomic inequalities in preschool asthma symptoms: the Generation R Study. *J Epidemiol Community Health* 2012; 66: 1017-24.
- Ellison-Loschmann L, Sunyer J, Plana E, Pearce N, Zock JP, Jarvis D, *et al.* Socioeconomic status, asthma and chronic bronchitis in a large community-based study. *Eur Respir J* 2007; 29: 897-905.
- 12. Bacon SL, Bouchard A, Loucks EB, Lavoie KL. Individuallevel socioeconomic status is associated with worse asthma morbidity in patients with asthma. *Respir Res* 2009, *10* : 125.
- Gautam VP, Shah A, Malhotra A, Dewanwala A, Taneja DK, Gupta VK, *et al.* General practitioners' knowledge of childhood asthma in Delhi, India. *Int J Tuberc Lung Dis* 2008; *12*: 677-82.

- 14. SK Jindal. Do we care asthma? *Indian J Med Res*, 2012; *135*: 157-9.
- 15. Litonjua AA, Carey VJ, Weiss ST, Gold DR. Race, socioeconomic factors and area of residence are associated with asthma prevalence. *Pediatr Pulmonol* 1999; 28 : 394-401.
- 16. Lewis S, Rechards D, Bynner J, Butler N, Britton J. Prospective study of risk factors for early and persistent wheezing in childhood. *Eur Respir J* 1995; 8: 349-56.
- Apter AJ, Boston RC, George M, Norfleet AL, Tenhave T, Coyne JC, *et al.* Modifiable barriers to adherence to inhaled steroids among adults with asthma: It's not just black and white. *J Allergy Clin Immunol* 2003; *111* : 1219-26.
- Rand CS, Butz AM, Kolodner K, Huss K, Eggleston P, Malveaux F, et al. Emergency department visits by urban African American children with asthma. J Allergy Clin Immunol 2000; 105: 83-90.