REVIEW ARTICLE

Environmental Tobacco Smoke (ETS) – A silent killer

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ABSTRACT

Environmental Tobacco Smoke (ETS) is a form of air pollution which is twice as deadly as all other types of air pollution combined together. ETS refers to exposure to tobacco smoke from someone else's cigarette, cigar, or pipe smoke. Breathing in ETS is known as passive smoking, second-hand smoke - SHS, or involuntary smoking. Although majority of Indians are fully aware of the health risks associated with smoking, but the fact that exposure to tobacco smoke released by someone else is also harmful is little known. As a result million of non smokers in India are slowly and silently being exposed to deadly levels of ETS. Tobacco smoke consists of 10% solid particles-tar & nicotine and 90% gases mainly carbon monoxide and carcinogens such as formaldehyde and vinyl chloride. Safe level of exposure to ETS has not yet been determined; however the exposure levels can be evaluated by estimating carboxy hemoglobin or cotinine levels in blood/urine or level of nicotine in hair. The harmful effects of ETS include cardiovascular and respiratory diseases, lung cancer, Sudden Infant Death Syndrome, middle ear infection, eye irritation, sore throat etc, Non-smokers living with smokers or those working in smoky atmosphere for long periods, asthma sufferers, pregnant women and children are more prone to health risks associated with ETS. Although stringent legislations exist in India but there is urgent need to strictly implement them. This along with mass awareness campaigns via media and educational institutes can help to achieve the goal of Smoke free India. The paper presents an appraisal of various aspects of ETS with special reference to India.

Keywords: Environmental Tobacco Smoke, Second hand smoke, Legislation, Awareness, India

INTRODUCTION

Tobacco kills approximately 6 million people and causes more than half a trillion dollars of economic damage each year. 6 lakhs out of these 60 lakh deaths are due to second-hand smoke. As per the global trend, 1 lakh people in India might be dying from breathing second-hand tobacco smoke. Environmental tobacco smoke (ETS) also called Second-hand smoke (SHS) or Passive smoking is the inhalation of smoke by persons

other than the intended "active" smoker (Liu and Peter, 2012). ETS is the combination of two forms of smoke from burning tobacco products: Side stream smoke (SS) – smoke from the lighted end of a cigarette, pipe, or cigar and Mainstream smoke (MS) – the smoke exhaled by a smoker (Gupta *et al*., 2002). Due to incomplete combustion SS is more harmful as it has higher concentrations of carcinogens and finer particles than mainstream smoke, which make their way into the lungs and the body's cells more easily. More than 4,000 individual compounds have been identified in tobacco smoke. Among these are about 60 compounds that are carcinogens, tumor initiators and tumor promoters (Dresbach and Sanderow, 2008). Some of the compounds present in ETS are tar, carbon monoxide, hydrogen cyanide, phenols, ammonia formaldehyde, benzene, nitrosamine and nicotine. ETS is classified as a Class A human carcinogen (EPA, 1993).

WHO is playing an important leadership and coordination role in assisting countries to combat the tobacco menace. The WHO Framework Convention on Tobacco Control which was ratified by India in 2004 includes the broad statement that "*scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease and disability*"(WHO, 2003). Article 8 forms the basis for international action to reduce the burden of disease attributable to environmental tobacco smoke, and it creates a legal obligation for the treaty's Parties to take action. WHO (2008) has identified six evidence-based tobacco control measures that are the most effective in reducing tobacco use known as "MPOWER": Monitor tobacco use and prevention policies, Protect people from tobacco smoke, Offer help to quit tobacco use, Warn people about the dangers of tobacco, Enforce bans on tobacco advertising, promotion and sponsorship, and Raise taxes on tobacco. To decrease tobacco use, WHO (2013) has further emphasized on complete ban on Tobacco Advertising, Promotion and Sponsorship – TAPS. The Global Tobacco Surveillance System (GTSS) of WHO aims to enhance country capacity to design, implement and evaluate tobacco control interventions. The GTSS includes the collection of data on tobacco use, advertising, cessation, secondhand smoke and perceptions of smoking behaviors through four surveys: the Global Youth Tobacco Survey – GYTS(youth aged 13-15), the Global School Personnel Survey- GSPS, the Global Health Professions Student Survey- GHPSS and the Global Adult Tobacco Survey - GATS (adults aged 15 years and older) (CDC, 2013).

Awareness about ETS is low in India. Public and the media can play a crucial role in disseminating information about the harmful health effects of ETS and the provisions of the smoke-free law. Making environments smoke-free will bring in many direct and indirect benefits. Much is needed to be done in this direction in India,

MATERIALS AND METHODS

Both formal and informal sources of literature in medical, social science and other tobacco control research and scientific journals were extensively reviewed to collect relevant articles and information about ETS with respect to India. Reports, factsheets and surveys conducted by various Global and Indian organizations also form a part of this analysis**.** Various aspects of ETS have been discussed with special reference to India.

RESULTS AND DISCUSSION

Exposure to ETS and Health risks

Globally, about one third of adults are regularly exposed to ETS (WHO, 2009). Findings from the GATS, India 2009 reveal that 52% adults (58% Rural and 39% Urban) are exposed to ETS at home while it is 29% at public places. According to GYTS India 2009, one in five students live in homes where others smoke; more than one-third of the students are exposed to smoke around others outside of the home and one-quarter of the students have at least one parent who smokes. ETS exposure at home could be considerably reduced by adopting voluntary smoke-free home restrictions. In India the "tobacco free schools policy" has been framed in June 2009. Measures should be taken to implement this policy in all the schools effectively which will help to reduce exposure to smoke in school environment (Gajalakshmi and Kanimozhi, 2010).To attain100% smoke free workplace, employers can create in-house interventions and can be provided a financial incentive to quit smoking (Ray, 2009).

No level of exposure to ETS is safe. There are sensitive and positive markers of exposure to ETS. For example, vapour phase nicotine and respirable particulate matter have been detected as markers for presence and concentration of ETS in the environment (Raja and Sultana, 2013). Carboxyhemoglobin levels in the blood,

urinary levels of cotinine (a metabolite of nicotine) and hair nicotine are extensively used as biomarkers of ETS exposure and uptake (Benowitz, 1999). Questionnaires are commonly used for assessing ETS exposure in health effects studies because they are relatively cheap and allow exposure assessment during different time periods and in different indoor environments (Gilmour *et al*., 2006).

Though the health risks associated with smoking are well known, majority of Indians are oblivious of ill-effects of ETS. Scientific studies have sufficient evidence to show that odds of developing various tobacco related diseases among those who are exposed to tobacco smoke are higher than those who are not exposed (Singh and Lal, 2011). Passive smoking increases the frequency of chromosomal aberrations in peripheral blood lymphocytes (Balachandar *et al.,* 2008). Exposure to ETS during pregnancy is associated with low birth rate (LBW) of neonates. Hence, there is an urgent need to increase awareness about health hazards of ETS during pregnancy and bring about behavioural changes accordingly as a one of the strategies to reduce LBW deliveries in India (Khattar, *et al.,* 2013). Exposure of non-smokers, especially children and women, to second-hand smoke from others is an important cause of respiratory infections, worsening of asthma and poor lung function (Chhabra *et al.,* 1999; Gupta *et al*., 2001; 2006; Jindal *et al*., 1996; Pokharel *et al*., 2001). Kabir *et al*., 2010 reported that childhood SHS exposure is considerably reduced due to voluntary smoke-free home restrictions. Also mandated comprehensive workplace and enclosed public smoke-free policies suggest an apparent benefit in decreased pre-birth risks and reduced asthma disease among children. Global studies indicate that ETS is also associated with higher risks of ischaemic and coronary heart diseases (He, *et al*., 1999; Law and Wald, 2003).There is utmost need for more research studies in this area from Indian subcontinent.

Legislation to control ETS in India

In terms of legislation in India, a beginning was made in the form of the Cigarettes Act 1975. However, a comprehensive tobacco control law of India (COTPA, 2003) brought all smoking and smokeless forms of tobacco products the realm of legislative control. The Indian law incorporated five important policies later adopted and recommended under FCTC i.e. prohibition of smoking in public places, ban on tobacco advertising and sponsorship, ban on sale to and by minors and within 100 yards of educational institutions, display of pictorial health-warning labels, and content regulation of tobacco products (PHFI, 2010).Prohibition of Smoking in Public Places Rules, 2008 under Section 4 of India's tobacco control legislation COTPA (2003), took effect from October 2, 2008. Accordingly, it is the duty of the owner or in-charge of affairs at public places to ensure the area under his jurisdiction is smoke-free. Prominent display of 60 X 30cm board saying, **"**No Smoking Area– Smoking Here is an Offence**"** at entrance and prominent places; contact detail for complaining; no ashtrays, lighters and matchsticks to facilitate smoking; smoking area only in airports and restaurant/hotels with seating capacity for 30 or more are the salient features of this law. Any person found smoking in a public place is liable to pay a fine of up to INR 200. Deshpande *et al*., (2010) reported that there was substantial improvement in air quality after the implementation of smoking ban at 25 public places in Mumbai indicating the effectiveness of the law. Contrary to this airborne nicotine levels were above the detection limit in 90% public places in Chennai (Selvavinayagam, 2010). The implementation of the COTPA depend upon the willingness of the stakeholders (Nayak *et al*., 2010).

As part of a comprehensive ban on tobacco advertising, promotion and sponsorship - TAPS, India has taken action to reduce tobacco imagery in films and television. Regulations put into effect in 2011 and 2012 now require films and television programmes depicting tobacco use to show anti-tobacco spot and disclaimers about the harms of tobacco at the beginning and middle and during scenes with tobacco use. Brand names or close-ups of tobacco products and movie posters depicting tobacco use are prohibited. These rules also assign responsibility for implementation to cinema owners or managers and television broadcasters, with penalties for violations including suspension or cancellation of licenses. Goa is the only subnational jurisdictions in India with a complete ban on TAPS.

Taxation is one of the most effective ways to counter tobacco consumption. Tobacco taxes are low overall in India, and are especially low for the products consumed most widely like bidis. Raising bidi taxes to Rs 98 per 1000 sticks from Rs 14 would raise over Rs 36.9 billion in tax revenues and prevent 15.5 million deaths in current and future bidi smokers. Similarly raising cigarette taxes to Rs 3691 per 1000 sticks from Rs 659 per1000 would increase tax revenues by over Rs 146 billion and prevent 3.4 million deaths in current and future cigarette smokers (John *et al*., 2010). Some of

these revenues can be dedicated to comprehensive tobacco control and public health programmes and providing alternate livelihood to those engaged in tobacco farming, manufacturing and the wholesale/retail trade.

ETS Awareness in India

It is important that the people must be made aware about their right to clean tobacco free air in public places. 66% of the smoke from a cigarette is not inhaled by the smoker, but enters the surrounding air, making it as dangerous as smoking. Increase consciousness that smoking harms not only the person who smokes but also those around him/her is important to protect people from exposure to SHS at home, where legislation has no effect. Several government and civil health organizations and voluntary health groups are working diligently towards the creation of smoke free society.
VHAI is one of the pioneers in tobacco control at the national and subnational level in India. Supported by the Bloomberg Initiative, it is carrying forward a strong political and media advocacy campaign to forbid use of tobacco. Kerala Voluntary Health Services (KVHS), with help of grant from the American Cancer Society in 2007 started many projects to increase community awareness about the legality and dangers of ETS in public places. KVHS formed Jagaratha Samithies (trained social groups) to launch grassroots efforts to reduce the public's exposure to ETS and KVHS conducted 15 public awareness campaigns that included exhibitions, audio and visual programs and public classes (ACS, 2011). Under the 'Tobacco Free Gujarat' campaign, the state government in 2011 has launched a website ctcph.com and mobile flying squads to ensure implementation of anti-tobacco provisions at educational institutions and public places. The event, 'United We Stand against Public Smoking', was organised (Oct, 2013) by Tobacco-Free Kerala (TFK) - a coalition working for tobacco control in Kerala wherein senior ranking officials in the state government and other eminent personalities joined forces to demonstrate the importance of collective and multi-sectoral efforts to control public smoking (Vyga news, 2014).Awareness, without bans on advertisements is unlikely to stop initiation of smoking among children. Despite a high level of knowledge about the ill effects of tobacco, cricket sponsorship by tobacco companies increases children's likelihood of experimentation with tobacco, by creating false associations between smoking and sport (Vaidya *et al*., 1996; 1999). One-third of youth experimentation with tobacco occurs as a result of exposures to Tobacco advertising, promotion and sponsorship (WHO, 2013).Tobacco industry is keen on targeting women and children and spends tens of billions of dollars each year on TAPS. The Tobacco industry also wants to create new avenues in the developing countries where legislation and its enforcement are not very effective. For instance, even after banning of Red and White Bravery Awards sponsored by the tobacco company in India, it could still run the awards by changing the name of the awards to the company's name i.e. Godfrey Phillips Bravery Awards. Therefore India has to be extra vigilant to counteract the newer strategies adopted by the tobacco companies to circumvent legislation.

CONCLUSION

Passive smoking exacts a high price on the health and economic wealth of our country. All people have fundamental right to breathe clean tobacco free air. Smoke-free laws protect the non-smokers as well as encourage the smokers to quit. India is committed to a vision of tobacco free society. In accordance with the WHO, FCTC, Indian Parliament had enacted comprehensive legislations for tobacco control and imposed the ban on public smoking and ban on advertisement of tobacco products. There is utmost need for a regulatory framework for effective monitoring and enforcement of the smoke-free law. Efforts need to be made to advance and scale up COTPA to international best standards for which evidence based research from within India should be strengthened. A significant increase in the existing tax on tobacco products will reduce cigarette and bidi smoking and the public health damage it causes plus generate higher tax revenues. Earmarking some of the new revenues to comprehensive tobacco control and other social and public health programmes can be politically viable and sustainable policy for smoke free India. There is need for creating larger public awareness about the harmful effects of ETS so that there is more voluntary compliance with the regulations. But the knowledge about adverse effects of smoking is overshadowed by false perceptions created by tobacco sponsorship and therefore ban on tobacco advertising, promotion and sponsorship in totality is essential. Women empowerment and education is vital as they can play a key role in making the home smoke free. 100% smoke free workplace policies can eliminate ETS exposure in the workplace. While we are fully committed to eliminate tobacco as a threat to global health at the same time we must provide alternate

livelihoods for those engaged in tobacco farming or manufacture.

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