

Side Stream Tobacco Smoke-Secondhand Smoke Effects On Increasing The Health Risks: A Review

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ABSTRACT:

Secondhand smoke is otherwise called as environmental tobacco smoke, cigarette smoke is harmful for both nonsmokers and smokers, this cigarettes smoke contains more than 3000 chemical combinations. In these chemicals more than 350 chemicals are harmful to cause illness. Cigarettes contains nicotine which has an addictive agent. Safety measurement should be taken by caregivers, parents and the owner of certain places like restaurants, mall, bar, etc. Smokers must smoke only in smoking area and it should be ventilated nicely. Tobacco smoke free environment act 2000 and tobacco smoke free environment regulation act 2016, helps to ban smoking in public places and to control the second-hand smoking.

KEY WORDS: *Second-hand smoke, Cigarette, Tobacco, Smoking, Exposure.*

INTRODUCTION:

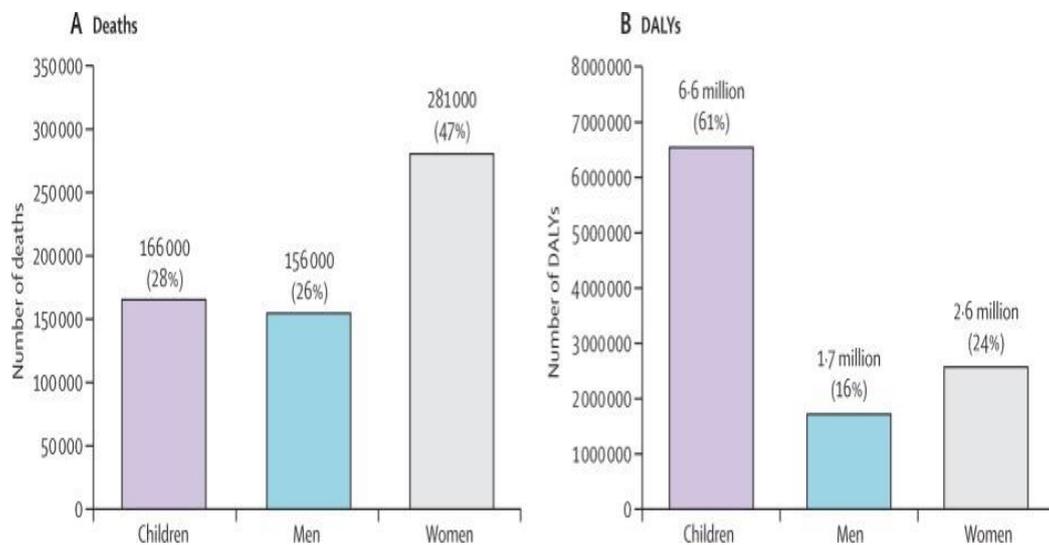
Second hand smoking is otherwise called as environmental tobacco smoke, burning of tobacco such as cigars, pipes and cigarettes smokes are harmful to both the smokers and nonsmokers. Every year more than 600,000 people die due to second hand smoke as reported by the world health organization (WHO) [14], Cigarette smoke has more than 3000 chemicals, in these 350 chemicals are known to cause illness [12,13], Fagerstrom test confirms that nicotine addiction level is more in cigarette smokers, who inhale smoke to lungs which transfers to brain by blood [15,16]. Carbon monoxide in the cigarette contaminates the hemoglobin than the oxygen. This increases the level of carboxyhemoglobin by combining the carbon monoxide with hemoglobin [17]. Smoking nearby nonsmokers is a high risk of developing lung cancer by 20-30%, [9,2,4] heart disease [1], stroke [6] and reduced fertility in adults, children have a risk of ear infections, respiratory infections, severe and frequent asthma attacks [5,10,9]. The awareness of second-hand smoking is established by the smoke free law to protect the people by reducing the tobacco smoking in particular outdoor public area and enclosed public area, by Tobacco Smoke Free Environment Act 2000 and Tobacco Smoke Free

Environment Regulation 2016. These bans help to protect the people from illness which is caused by second hand smoke. [7,8]

Negligence Of Second-Hand Smoke:

Every time over 5.5-minute life time is reduced while smoking each cigarette. Both the smokers and nonsmokers have 10 times risk of getting lung cancer [13,8,4,9], 7 times risk of chronic obstructive pulmonary disease (COPD) [9], 4 times risk of myocardial infarction. Smoking nearby nonsmokers is a high-risk exposure to smoke [11,4], smoking in public places such as shopping mall, working place, parks, car, public transport, schools, colleges, restaurants, etc. these places have a high chance of exposure to second hand smoke [10,11,14], smoking at home by father or brother has high risk of frequent exposure to children. They are especially allergic to the chemicals in secondhand smoke [10].

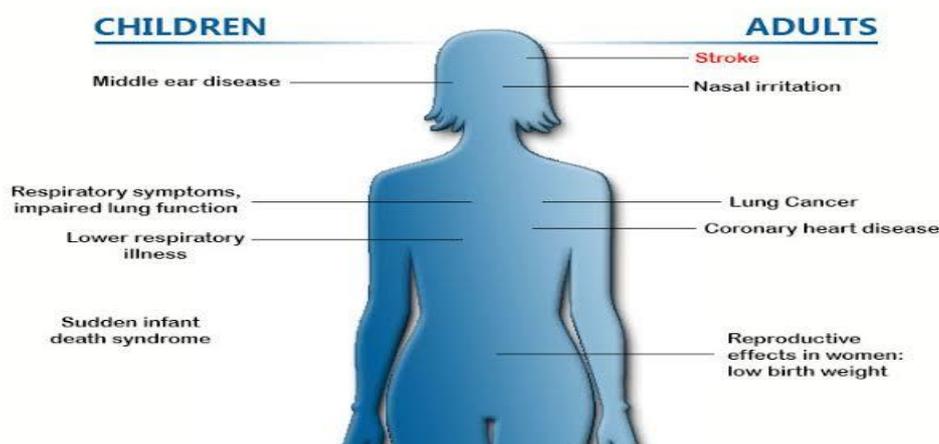
Table 1: shows a retrospective analysis of data from 192 countries.



(SOURCE: Worldwide burden of disease from exposure to second-hand smoke).

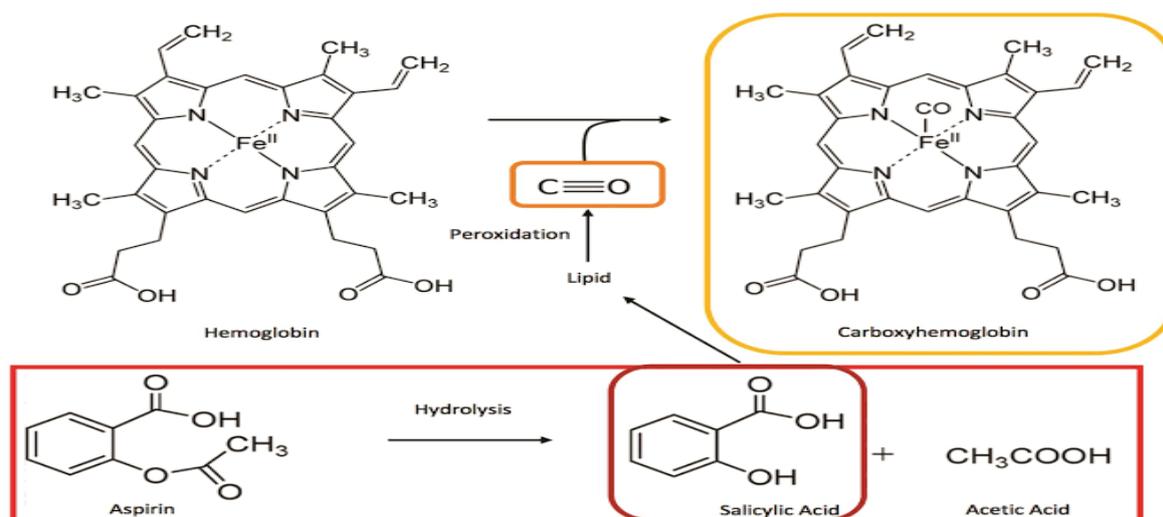
The above table signifies that 28% of children death, 47% of women death and 26% of men death [21]

The effects of second-hand smoke/passive smoking are high risk particularly in children because they normally breathe faster than the adult breathing rate, respiratory disease such as bronchitis, pneumonia, wheeze, cough, middle ear infection etc. [14,2,9] As like as in children adults also have an effect to passive smoking like (40% cases) headaches, (70% cases) irritation of eye, (30% cases) respiratory symptoms, (25% cases) allergic symptoms and cough [13,11,12].



[20]Carbon monoxide is a chemical which is found in the cigarettes, it has 250 times more affinity to the hemoglobin than oxygen. Carbon monoxide and hemoglobin combination is known as Carboxyhemoglobin. The normal level of COHB in non-smoker is <1.5%, COHB level is measured in whole number with the help of Rad-57 Pulse CO-Oximeter, COHB level in smoker will be between 3-15%. COHB level is decreased with the hyperbaric oxygen therapy by exposing the patients to 100% oxygen under supra-atmospheric condition [17].

Figure 2: show the molecular structure of hemoglobin and carboxyhemoglobin.



(SOURCE: Carboxyhemoglobinemia and methemoglobinemia in an atypical case of salicylate toxicity) [22]

1. Yearly 9,000 deaths by stroke is caused by second hand smoke.
2. At work and home, nonsmokers are highly exposed to second hand smoke and increasing their risk of inducing cardiovascular disease by 30-45% [11,4].
3. The regular functioning of the heart vascular system and blood in ways may increase the high risk of heart attacks which is interfered by second hand smoke [1,12].
4. Chances of severe heart attack exposed to second hand smoking, could damage the blood vessels lining and platelets become stickier, these changes induce heart attack [6,1,4].
5. Especially the person who already have a heart problem are having a high risk of suffering, from breathing passive smoking, they must be more conscious to avoid the exposure. [14,1].

Tobacco Smoke Free Law Act:

Smoke free law is formulated not to prohibit the smokers from smoking. These laws only limits where they need to smoke to protect others from the exposure to tobacco smoke. The government of India introduces these tobacco smoke free act, to limit the smoking in public place which helps to maintain the tobacco smoke free air for the non-smoker. Cigarette and other tobacco products act, 2003 (COTPA) was declared by Indian government at 2004, COTPA must be strictly followed in public places like hotels, bars and restaurants [7,8,1], The owner must be aware of this act and they should arrange the smoking zone with the exhaust ventilators to avoid the second-hand smoke. COTPA allots designated smoking area (DSA) but owners of small stall are already managing with allotted small areas so they can't afford to arrange the smoking area. [3,8,13],



[23]In village areas, the tea stall owner are unable to warn the person who are smoking in the table with other nonsmoker's, smoker should be aware of this second-hand smoke and they must smoke in smoking zone which helps non-smokers and kids to maintain their health. This act helps to maintain a smoke free zone in certain public places and reduces the rate of person who are affected by Second hand Smoke. [1,3,8]. The aim of tobacco control act is to protect the public health by regulating the manufacture, marketing and the distribution of tobacco products, the FDA has ability to contact the states to inspect the retailer, while buying the tobacco, Shopkeepers must ask the age proof to buy a tobacco product. The smokeless tobacco should have the health warnings in their labels, the label must be at the top of both the back and front in the packages to warn the smoker.[19]

Currently 17 countries only have smoke free policies that provide universal and effective protection from second-hand smoke, good policies with inadequate compliance does not Protect people from the danger, implementation of policy must be accompanied by high level of compliance with those policies, comprehensive bans more like smoke free law covers only the public places like Restaurant's, mall, etc. [18]

1. Smoke Free Environment act, 2000
2. Cigarettes and Other Tobacco Products Act, 2003 (COTPA)
3. Children Health Insurance Program Reauthorization Act of 2009
4. Patient Protection and Affordable Care Act of 2010
5. Smoke Free Environment Regulation, 2016

Even more laws are there to control and protect the cigarettes smoking and to prevent the exposure to smoke.

NICOTINE ROLE IN TOBACCO ADDICTIONS:

35 million cigarette smokers try to quit each year but only about 6-9% of them are successful for more than just a month [16], Major part is played by nicotine in tobacco use. Smoking cigarette is a habitual addiction in every smoker, this addiction in users are faster than other drugs like Ursprung and Difranza,2010 [15]. The nicotine pathophysiology is dependence of individual to adjust and feel normal. Nicotine pathway begins when the lungs absorb. Nicotine is rapidly moved by blood to the brain and other targets [15]

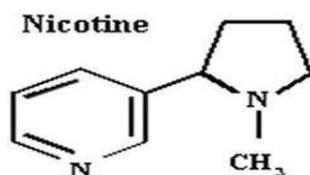
Nonsmokers are directly exposed to airborne nicotine by second-hand smoke, 50% to 70% of airborne nicotine is inhaled by nonsmoker.,Hair samples of certain bar and restaurant workers has a high-level of nicotine concentration even if they are nonsmoker, nicotine concentration in the hair has long period of time (30 days) in each hair. Second-hand smoke exposed nonsmokers has nicotine concentration in blood which induced the psychoactive effects at the same level in smokers. Biomarkers helps to measure the airborne nicotine which is pharmacologically exposed, nicotine is

metabolized and converted into cotinine, this is frequently found in saliva, blood and urine. Cotinine in saliva provides short term exposure to nicotine (2 to 4 days).[26]



Peripheral nervous system also has a direct effect by nicotine. Mental disorder has been included and diagnosed by nicotine related disorders list since 2000 [16]. The cholinergic receptors, acetylcholine, serotonin and beta-endorphin are involved by nicotine which will alter the brain and its physical neurocircuitry [16], the nicotine level is tested in cigarette smoke by the Fagerstrom test for nicotine dependence (FTND),1991; This test was introduced by Heatherton, Koazlowki, Frecker, &Fagerstrom.

Figure 3: shows the molecular structure of nicotine.



(SOURCE: Molecular structure of nicotine and similar drugs) [24]

The U.S. department of health and human services [U.S. DHHS] observed and researched a lot about the nicotine in cigarette smoke and in 1988 have confirmed that the role of the nicotine addiction established forever, and nicotine is the most important addictive component of cigarette [15]. 40 questions were composed in the questionnaires which is divided into three parts, part one they have examined the characteristics demographic including their gender, age, family members, medical history, education, career, and alcohol history.[14] In part two, history of smoking will be evaluated, the Fagerstrom test for nicotine dependence (FTND), smoking cessation experience, and plan for smoking cessation, smoking quitted reasons. These questions will be asked to the patient in the second part. In part three, questions about second-hand smoke health risks and the information sources, the sources of information by television ads, smoking cessation education, public services ads, news. In part four testing the knowledge about the second-hand smoke by asking eight questions, the degrees about these parts, questionnaires will be measured on a five-point Likert scale by confirming which degree they have agreed with each statement; 1(strongly disagree), 2(disagree), 3(neutral), 4(agree), 5(strongly agree).[14] De-addiction of cigarette smoking helps the smokers to quit the addiction, categorized and divided as five counseling sections,

Explaining and alerting the patient about the advantages of quitting the habit

1. Asking and interacting with the patient about smoking
2. Helping those who willing to quit
3. Arranging and giving contact and referral resources like placebo and NRT.

4. Assessing and motivating the patient to do some other activity like reading and painting etc. [16]

Safety Protocol And Health Effects:

SHS is harmful to people at any stages of life like before birth, infancy, childhood, adolescence and adulthood. [14,2,1,5]. Smoke effects during pregnancy contributes to low birth weight, colic, stillbirth, preterm delivery, sudden infant death syndrome, cleft lip and cleft palate. Children exposed to SHS are at increased risk of asthma, breathing problem, tooth decay, pneumonia, sleep problem, vision problem, cardiovascular risk, earaches and developmental delays [5,2,4].

The studies related to SHS should be published by creating the awareness of the risk and related diseases, estimate the prevalence about smoking and second-hand smoke risks towards the knowledge and attitude should be evaluated. Hospital staffs contribute their knowledge and risk about second hand smoke by explaining to the uneducated and unaware people about this second-hand smoking. The knowledge about the smoking will differ from one person to another and according to their knowledge, scores and gender will be linked to the factors. [14]

The most common exposure source of SHS for youth is smoking by caregivers or parents in the home. Smoking can spread from one room to another within a building even if the doors to the smoking area are closed in multi units housing flats, smoke travels through ventilation system and common areas [11,10].

There was some important progress taken between 2007 and 2008 to protect the people from the exposure and harm of second-hand smoke. This law is implemented and protect the harms worldwide in just one year by increasing the comprehensive smoke-free laws from 3.1% to 5.4%, so that 160 million additional people are protected from the harm and exposure of second-hand smoke.[18]

1. Don't allow cigarette smoking in your home or in your car.
2. The important way to protect cigarette smoking against SHS is to avoid or quit the cigarette smoking in public places.
3. Consult your pediatricians about the ways to keep your child safe from SHS.
4. Don't allow smoking cigarette near you or your own children.

[14].The Affordable Care Act helps to expand the tobacco cessation therapy but there is no guarantee that everyone will get the medications and services. The essential beneficial package is an insurance plan to cover the comprehensive package at 2014. New resources and new prevention fund is given by ACA to support and helps the CDC's tobacco control efforts.[19]

CONCLUSION:

Second-hand smoke affects the adults, children who don't even smoke and causes premature death. Protecting the non-smokers by avoiding smoking in indoor spaces can control the second-hand smoke exposure to the non-smokers. Smokers should avoid smoking with nonsmokers, children and person who have health issues because the smokers are unknowingly causing the harmfulness to the non-smoking persons by smoking in public places. Government is formulating many acts and rules to avoid this second-hand smoke but smokers only can help the nonsmokers from the exposure to second-hand smoke.

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