Risk of stroke associated with secondhand smoke exposure

Overview: Worldwide 16 million people suffer a stroke and 5.7 million die from the condition every year (Strong et al. 2007).

In the UK stroke accounts for 5% of NHS spend, with the total cost of treatment and lost productivity amounting to £8.9 billion per year (Saka et al. 2009).

Smoking is a recognised risk factor for stroke. There are more than 4000 chemicals in tobacco smoke, of which at least 250 are known to be harmful to health. Secondhand smoke, released into the air when people burn tobacco products such as cigarettes, bidis and water pipes, is thought to be responsible for 600,000 premature deaths worldwide every year.

Current advice: The NICE Pathway: stroke brings together all related NICE guidance and associated products on the condition in a set of interactive topic-based diagrams.

NICE affirms a link between breathing secondhand smoke and the health of people who do not smoke. For example, it can exacerbate respiratory symptoms and trigger asthma attacks. Longer term, it increases the risk of lung cancer, respiratory illnesses (especially asthma), heart disease and stroke. Exposure to secondhand smoke in pregnancy can reduce foetal growth and increase the risk of preterm birth.

Guidelines to Article 8 of the WHO Framework Convention on Tobacco Control state there is "no safe level of exposure to tobacco smoke". Therefore, creating 100% smoke-free environments is the only way to protect people from the harmful effects of secondhand tobacco smoke.

New evidence: A random effect meta-analysis was used to provide a pooled estimate of the risk of stroke associated with secondhand smoke exposure, to determine whether or not there is a dose relationship (Oono et al. 2011). The 20 eligible studies comprised a total of 885,307 study participants, of whom 5894 (0.7%) suffered stroke.

The results showed a non-linear dose relationship, with relative risk of stroke increasing from 1.16 (95% CI: 1.06-1.27) for exposure to 5 cigarettes a day to 1.56 (95% CI: 1.25-1.96) for exposure to 40 cigarettes a day, when compared with people exposed to 0 cigarettes a day. There was a disproportionately high risk of stroke at levels of exposure lower than 15 cigarettes per day, suggesting that there are no safe lower limits of exposure.

The study provides evidence of a strong, consistent and dose-dependent association between exposure to secondhand smoke and risk of stroke, suggestive of a causal relationship.
Commentary: "We have known for some time that there is strong and convincing evidence that cigarette smoking is a major independent risk factor for ischemic stroke. The risk associated with smoking is present at all ages, in both sexes, and among different racial/ethnic groups. Whilst we should always assume that if direct smoking is harmful, secondhand smoking is also harmful, as it is biologically implausible that the offending agents are able to affect the smoker only, evidence is important to determine whether it is a serious risk. In 2006, there was growing evidence that exposure to secondhand smoking increases the risk of cardiovascular disease, including stroke (Sacco et al. 2006). This meta-analysis confirms that the risk is serious.

"The dose relationship is an impressive confirmation that the association is almost certainly causal especially since it is difficult to accurately quantify exposure. The meta-analysis is highly likely to have underestimated the damage of secondhand smoking as all of the studies reported results for non-smokers which were defined as never smokers but some also included ex-smokers or infrequent current smokers. As regular smokers are more likely to mix with other smokers, the additional risk of secondhand smoking to smokers is probably even greater than for nonsmokers.

"The meta-analysis supports measures to reduce secondhand smoking. For those who have suffered a stroke or a transient ischaemic attacks, the results indicate that not only the patient should be encouraged to give up smoking but also those close to them or, at the very least, not to smoke in their presence or in their home or car." - Dr Peter Elton, Director of Public Health, NHS Bury

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