Smoking, nightclubs, bars and partying in relation to meningococcal disease – a brief overview

There are a number of factors that have been linked with meningococcal disease outbreaks in other countries that have similar characteristics in common to the Tasmanian September/October 2001 outbreak.

Overcrowding

Several studies refer to overcrowding in houses and social gatherings. [1] [2] [3] [4]

Discos and bars

Some studies refer regular attendance at discos, night clubs or bars.[5] [6]

These studies refer to factors such as frequency of visits to a hall bar, active smoking and intimate kissing. Bar environments *"…may favour the spread of meningococcal disease among teenagers and young adults."*[7].

In Argentina an outbreak amongst young people was also linked to nightclubs. *"These data suggest that dance clubs or discos may be the focus of transmission of N meningitidis in young people"[8]*

Smoking

Numerous studies refer to the relationship between active and passive smoking and the development of meningococcal disease. and the risk of carriage increases significantly with heavier smoking[9],.

The US Centre for Disease Control, in Atlanta says "*Antecedent viral infection, household crowding, chronic underlying illness and both passive and active smoking also are associated with increased risk for meningococcal disease."* [10] However, chronic underlying illness was more common in older patients than in young adults.*[11]*

Tobacco use has been described as being "……..*thought to be responsible for almost one third of cases"* .[12]

Similarly, in marine commando recruits, "*Active and passive smoking combined to give an attributable risk for meningococcal carriage of 33%" [13]*

Cigarette smoking in the home was associated with increased rates of meningococcal in children.[14] [15] and adults[16].

Fischer et al reported that *"Tobacco smoke exposure independently increases the risk of developing meningococcal disease"[17]*

Visiting night clubs, active smoking, intimate kissing and being male were factors found more likely to be associated with acquisition of meningococccal in a group of first year university students in England. [18]

There appears to be a dose response relationship between passive or active smoking and risk of meningococcal acquisition. "*Dose-response effects were observed for passive smoke exposure and risk of disease in all age groups."* [19]

Similarly, a case control study in the UK suggested a dose response relationship between both passive and active smoking and meningococcal. The authors said;

> "*Public health measures to lower the prevalence of cigarette smoking by parents of young children may reduce the incidence of MD* [meningococcal disease]" [20]

This study – by Stanwell- Smith et al is one that seems to have particularly worried the tobacco industry and is the subject of analysis by P.N. Lee (tobacco company scientist) and is recorded on the Phillip Morris website.[21]

It has been reported that the mortality rate among passive smoke exposed patients was over twice that of those who were not exposed.[22]

An aetiological explanation for the increased rates of meningococcal in smokers and passive smokers may lie in the increased ability of bacteria to adhere to mucosa.

> *"We conclude that smokers might be more densely colonised by a variety of potentially pathogenic bacteria. The enhanced bacterial binding to epithelial cells of smokers is not related to enhanced expression of host cell antigens that can act as receptors for some species, but possibly to components in the smoke that alter charge or other properties of the epithelial cell surface. Passive coating of mucosal surfaces with components of cigarette smoke might enhance binding of potentially pathogenic bacteria." [23]*

Carriage

The issue of meningococcal carriage (as opposed to expression of the disease) seems complex and one study found that;

> "*Although passive exposure to cigarette smoke has been associated with meningococcal disease, there was no association between passive smoking and carriage. There was, however, a significant association between active smoking and carriage."[24]*

However, another study found the opposite effect. i.e. that

> *"….active and passive smoking were found to be independently associated with meningococcal carriage in logistic regression analyses".[25]*

Similarly a study of Greek military recruits found an association between smoking and carriage.[26]

Another study found carriage associated with increasing family size, discotheque visits and visits to youth and sport clubs.[27]

A Czech study links carriage to both active and passive smoking, as well as other factors, including overcrowding, and attending training courses away from home. [28]

Active and passive smokers in a New Zealand study were found to have a higher carriage rate than those living in smoke free houses. [29]

Another earlier (1989) British case control study reported in the Lancet that "*Active and the presence of other smokers in the household was independently associated with meningococcal carriage; the risk of carriage increased with heavier smoking"[30]*

Marijuana use

Marijuana use and social contacts were linked to a number of cases of meningoccocal disease in the USA..[31]

Useful resource links

CDC Report on the Prevention and Control of meningococcal disease http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4907a1.htm

Guidelines for the early clinical and public health management of meningococcal disease in Australia – Communicable diseases network – Australia http://www.health.gov.au/pubhlth/cdi/pubs/pdf/mening_guide.pdf

Victorian Government – Public Health Division, Department of Human Services. http://www.dhs.vic.gov.au/phb/9912023/

National Health and Medical Research Council (NHMRC) http://partners.health.gov.au/nhmrc/advice/nhmrc2/foreword.htm

Westmead Children's Hospital http://www.chw.edu.au/parents/factsheets/mencoccj.htm

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[21] The Philip Morris website has analysis on several articles relating to meningococcal including this one.
http://www.pmdocs.com/getimg.asp?pgno=0&start=0&if=avpidx&bool=meningococcal&docid=2028425405/5410&docnum=3&summary=0&sel1=
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[31] Krause G et al "Marijuana use and social networks in a community outbreak of meningococcal disease." South Med J 2001 May;94(5);482-5 **N.B the people who developed the disease were not necessarily the ones who were smoking, it may have been their contacts**