
COMMENTARY

Conclusions from Smoking-Related Research Published in the APJCP in 2000 with a Brief Review of the Recent Literature

Malcolm A Moore

Introduction

Since there are no other smoking related papers in the present issue of the APJCP the editors have decided to include the present commentary, basically a paper prepared for this years Thai National Meeting on Tobacco or Health, to be held in Pattaya July 11-13, 2001. A report of the meeting itself will be included in the next issue. The idea is to delineate the scope of work being carried out in the Asian Pacific area by making reference to papers that have been published in Volume 1 of the APJCP and by comparison with research results published in other scientific journals develop a comprehensive program for future research and practical intervention. Of the total of 13 relevant papers which appeared in the APJCP, five concerned the extent of the problem and various aspects of risk (Gajalakshmi and Peto, 2000; Kiyohara et al., 2000; Liu et al., 2000; Mochizuki-Kobayashi and Moore, 2000; Peto and Lopez, 2000), four covered socioeconomic factors (Hoshiyama et al., 2000; Kitagawa et al., 2000; McCredie et al, 2000; Sen and Basu, 2000) and four concentrated attention on the practicalities of how to effect smoking cessation (Bal et al., 2000; Hamajima and Matsuo, 2000; Moore, 2000; Ozasa et al., 2000). For the present purpose the conclusions to be drawn are accordingly discussed within these three major areas, with subdivision into different sections of particular interest.

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The Scope of the Problem

Extent of Smoking and Correlation with Disease

Comparison of WHO data for smoking in different countries of the Asian Pacific and their incidence rates gives a clear pointer to the importance of smoking, and particularly the numbers of cigarettes consumed, in terms of lung cancer (Mochizuki-Kobayashi and Moore, 2000). Thus a very good correlation was observed between cigarettes/male smoker over 15 and the incidence ($r=0.56$ $p<0.005$). Future work of this type should perhaps take into account the variation between squamous cell carcinoma and adenocarcinoma in terms of smoking as a risk factor, so that a more accurate picture can be generated (Moore et al., 1999). However, in this context it is important to realise that passive smoking may also be a factor in adenocarcinoma of the lung, which appears to be on the rise, particularly in non-smoking females (Jee et al., 1999; Boffetta et al., 1999), although not all the published data are in line with increased risk (Wang and Zhou, 1997). These findings bring into question moral imperatives regarding where smoking should be curtailed by law and in which locations it might be 'safely' allowed,

this being dealt with further in the section on future strategies. It should also be remembered, furthermore, that trends in cigarette consumption cannot fully explain variation in British lung cancer rates, for example, and there are a number of other related factors which might be of great importance (Lee and Forey, 1998). As emphasised in a review by Pandey and co-workers from Trivandrum in southern India, the lack of case-control and cohort studies from Asia makes conclusions difficult. Since the relationship between tobacco and cancer is very complex, more research in third world countries is clearly a high priority (Pandey et al., 1999).

With regard to the general burden on societies posed by tobacco consumption, however, there seems to be little doubt as to the magnitude of the problem. For example, Peto and Lopez (2000) presented very graphic data, especially for the alarming extent of increase in cigarette smoking in China and the impact that this will eventually have on the male population in this country. They estimated on the basis of 1990s British and American evidence that fully 50% of persistent cigarette smokers will eventually die because of the habit, a quarter in middle age, but that stopping before

Table 1. Smoker/Non-smoker Risk Ratios for Various Diseases (Males)

Cause of Death	Chennai, India	Taiwan
All neoplasms	2.1	1.5
Lung/Larynx	4.1	3.7
Mouth/Pharynx	3.2	
Oesophagus	2.5	
Stomach	-	1.9
Liver	-	2.2
Tuberculosis	4.5	-
Other Respiratory	2.8	1.9
Vascular	1.8	1.8

Data from Gajalakshmi and Peto, 2000 / Liaw and Chen, 1998

this is very effective. They argue strongly that, given the millions of tobacco deaths involved, efforts to persuade adult smokers to quit and young people not to start are of the highest priority. Gajalakshmi and Peto (2000) found significant increase in risk of mortality from all cancers, especially lung and larynx, and pulmonary tuberculosis in Tamil Nadu (see Table 1). Similar data were published for Taiwan by Liaw and Chen (1998), who found increased risk for many cancers as well as cerebrovascular disease. Basically there is no room for doubt that tobacco smoke and the included carcinogens are responsible for a large proportion of cancers in very many body sites, as much as one in seven as estimated by Parkin et al (1994).

Carcinogen Dose Dependence, Genetic Background and Mechanistic Aspects

From a purely toxicological pathology viewpoint it would be expected that dose of carcinogen intaken is an important consideration with the ill effects of smoking so that, while total cessation is clearly the optimal solution, any measures that act to bring about a reduction in the number of cigarettes smoked is to be vigorously welcomed. Cigarette years of exposure, for example, was shown to be important for colon adenomas in the paper by Hoshiyama et al (2000). This is a typical finding in line with the well-documented decrease in risk after cessation of smoking. The data are unclear however, as to whether other non-carcinogen factors are just as important with smoking, like for example the impact on

Table 2. Components of Tobacco Smoke

Factor	Action	Counter-measure?
Carcinogens	DNA Damage Oxidation	Antioxidants
Particles	Irritation	Anti-inflammatory Drugs
Unknown?	Lipid metabolism	Physical Exercise
Nicotene	Dependence	Pharmacological Drugs

other respiratory disease, itself linked to lung cancer (Nakachi et al., 1999). Clearly more work on this point and the possibility of thus counteracting effects in the lungs by appropriate use of medicines is desirable. One related area which does not seem to have received any attention in the Asian Pacific is the question of whether amelioration of risk from smoking is possible by dietary improvement or supplementation with antioxidants or anti-inflammatory drugs, or example (see Table 2 for risk factors and possible countermeasures). Without a deep awareness of the detailed mechanisms whereby tobacco smoke exerts its detrimental effects, however, and an understanding of how exogenous factors may impact there is little hope of chemoprevention for the very high risk smoking population, as evidenced by the failure of the Finnish and US studies of beta-carotene, where enhancement was the initially unexpected outcome (Omenn et al., 1996), which might have been forecast however given the potential of antioxidants to act as pro-oxidants under certain conditions. This points to the necessity for further research in animal models to dissect the processes underlying smoking-related disease.

Regarding the physiological effects of smoking, one paper by Bermingham et al (1999) deserves mention, documenting a markedly detrimental effect on lipid risk factors for cardiovascular risk factors in Vietnamese refugees in Australia.

An important aside to the carcinogen dose-dependence is the question of relative risk alteration due to the genetic background. At the individual level the importance of polymorphisms in drug metabolizing enzymes was for example investigated by Kiyohara et al (2000), their findings generally echoing the literature in indicating a role for a decreased ability to detoxify carcinogens in tobacco smoke in enhancing risk. This is usually not the case for carriers of the same polymorphisms in non-smokers, providing convincing evidence that the degree of carcinogen exposure is of essential significance, a conclusion supported by the findings of a series of investigations reported in the present volume (Hamajima et al., 2001). Dose dependence, this time regarding passive smoking and breast cancer risk was also found for Chinese female non-smokers by Liu et al (2000).

Socioeconomic Aspects

Confounding Factors

As shown by Kitagawa et al (2000), taking into account differences in lifestyle is very important for epidemiological research into the effects of smoking on disease incidence and severity. As summarized in Table 3, they found smokers to generally be more likely to miss meals and ignore questions of dietary balance, be regular consumers of alcohol, and relatively low intake of fruit and vegetables. Their participation in screening was also found to be lower than in the non-smoking group, in line with previous studies in Japan Linkage of smoking with an unhealthy diet has been stressed earlier (Nakamura et al., 1996) and this appears to be a characteristic independent of the culture. What

Table 3. Lifestyle Association

Factor	Smokers	Non-Smokers
Regular Alcohol (%)	81.8	62.8
Missing Meals	13.4	5.8
Dietary Intake (g)		
Vegetables	224	288
Fruits	428	802
Milk	180	335
Mess Screening (%)	80.2	90.5

Data from Kitagawa et al., 2000

variation does exist might, for example, explain the differences found by McCredie et al (2000) between Maori and Non-Maori New Zealanders, with very much higher rates for lung and upper digestive tract cancers in the former, but lower values for urinary bladder tumours pointing to organ specific influences.

Adolescent Initiation of Smoking

Socioeconomic factors clearly play a role in determining whether a young person will commence smoking or not. In their paper, Sen and Basu, provide data for age of starting, the period from 14-18 appearing to be the most important, with a rise from 1.78 - 4.65 risk relative to that at 14 years old. In China, Chen et al (2001) found rapid increase after 10 years of age, with a peak at 14-15 in males. Females generally started after 12 and demonstrated a much lower risk of smoking initiation, a finding.. Age factors may have long term significance because they are significantly related to persistence and daily smoking (Everette tal., 1999). Most important determinants of initiation in India are whether friends or close relatives smoke (Sen and Basu, 2001). A dominant influence of peers and older brothers was also found in Semarang, Indonesia (Smet et al., 1999). In one study in California, movie stars smoking had only a slightly lower influence than friends or family habits (Distefan et al., 1999). Whether a similar situation exists for Asia, and the types of people who have major significance with respect to image building in the young remains to be determined by research. If parents cease smoking this has

Table 4. Factors for Adolescent Smoking

	Percentage Smokers
Sex Male/Female	18.2/4.1
School Government/Private	17.4/12.5
Parent Smoking Y/N	18.5/11.6
Brother Smoking Y/N	17.1/3.0
Friend Smoking Y/N	29.4/3.0
Betel Chewing Y/N	35.9/13.2

Data from Sen and Basu, 2000

benefit but mostly if this occurs before the child reaches 9 years of age, and in fact it is a case of the earlier the better (Farkas et al., 1999).

In the US, youths living in towns with a local tobacco sales ordinance were found to be significantly less likely to progress to established smoking (Siegel et al., 1999). A link to advertising in magazines has been demonstrated, at the brand level (Pucci and Siegel, 1999). Advertising evidently plays a major role, college students at 12 universities in China being well acquainted with foreign brands, this correlating with a preference for such cigarettes (Zhu et al., 1998). Even primary school children aged between 7-13 years were found in Ankara, Turkey, to recognize cigarette brand names and logos, clearly a reflection of the success of tobacco advertising efforts (Emri et al., 1998). Market liberalisation is an important component of the tobacco company strategy and it has been shown to significantly contribute to increasing smoking prevalence among Japanese women and adolescents (Hojo and Kawachi, 2000). The only advantage is that it highlights the dangers and therefore may indirectly promote control efforts. .

The question of the link between education and smoking habits is highlighted by the finding that female nurses in Japan have a higher smoking rate than the general female adult population (Ohida et al., 1999). Having friends who smoke and living alone are factors in Japanese nursing students, who demonstrated a 3-10% increment in one year period, nicotine dependence also increasing in the daily smokers between the time points investigated (Ohida et al., 2001). Clearly, screening for nicotine dependence is necessary, for example in smoking related cancer patients (Mikami et al., 1999)., and this is a possible area of collaboration with the pharmaceutical industry in preventive measures.

Practical Smoking Cessation

Background and Physician Education

The role of general awareness is highlighted by one large scale survey in China which showed 72% of current smokers to have no intention to quit, and with those that did quit it was usually usual because of illness (Yang et al., 2001). participants with university education more likely to have made an attempt to quit. Education level also a factor in Saudi Arabia, along with certain occupations (Jarallah et al., 1999). Muslim religious profession may protect against smoking, better rates for never-smoking and current smokers than other personnel (Acik et al., 2001). However, the extent of the problem can be best realised by the finding of increased rates of smoking and decline of anti-smoking counselling among Chinese physicians in the period from 1987-1996 (Li et al., 1999). In Turkey, only a small minority of smoking physicians appear to be involved in smoking counselling and the necessity for better education through from undergraduate to practising doctor, with reimbursement for cessation programs has been emphasised (Esen et al., 1999). Similarly more stress on education of nurses and provision

Table 5. Japanese Hospital Intervention Studies

a) Human Dry Dock		Instruction	No Instruction
I 6 months quit:	All	8.9	5.9
	Light smokers	22.2	2.3
II One Year Quit		10.1	5.3
	5 Years Quit	16.1	13.1
III One year Quit		18.8	15.1

b) Outpatient First Visit (% Smoking Cessation)			
	Control	Non-specific	Specific
Non-Cancer	13.7	16.7	17.3
Cancer	70.4	73.3	81.1

Data (%) from Ozasa et al., 2000 and Hamajima, 2000 of incentives to undertake cessation activities is to be recommended (Nagle et al., 1999). In one worldwide survey of education on tobacco in medical schools, only a third were found to teach smoking cessation techniques while a specific tobacco module was included in only 11% (Richmond et al., 1998)..

Hospital Based Intervention

Making use of opportunities to get across the anti-tobacco message in hospitals was the focus of Hamajima and Matsuo (2000) and Ozasa et al.(2000), respectively, for first visit outpatients at a cancer hospital and patients undergoing the so-called human Dry Dock, or regular comprehensive checkup in Japan. The findings are very encouraging (see Table 5), and Ozasa et al estimated that

potential increase in smoking cessation could extend to an extra four percent of smoking male participants, or around 70,000 individuals a year. In the outpatient setting, those with cancer given a pen embossed with a message that tobacco is dangerous were found to be more likely to cease smoking and a similar trend was observed for non-cancer cases.

Community-Based Intervention

For the general populace, community action intervention needs to be stressed, although the lack of success in rural Australian towns, in terms of both adolescent smoking and adult quit rates (Hancock et al, 2001a; 2001b), points to the need for a greater understanding of psychological factors. The potential for applying psychology to persuade people to reject the habit was the subject of an editorial in the APJCP (Moore, 2000) and the contribution that local Primary Prevention Program centres might make in both education of the public and researching into factors like efficacy of different types of posters (see Figure 1) or black humour in cartoons (Hansen, 1997) is discussed in more detail in the editorial in the present issue (Tajima and Moore, 2001). Presumably the impact of such visual aids will be dependent on cultural factors and this is an obvious area for more emphasis in future research. Since mental health may be worse in female smokers than non-smokers, an active role for psychiatry might also be proposed (Mino et al., 2001). Nurses can be very effective in cancer prevention efforts and may be generally in favour of active intervention, although they were found more likely to support restriction of smoking than a total ban in the

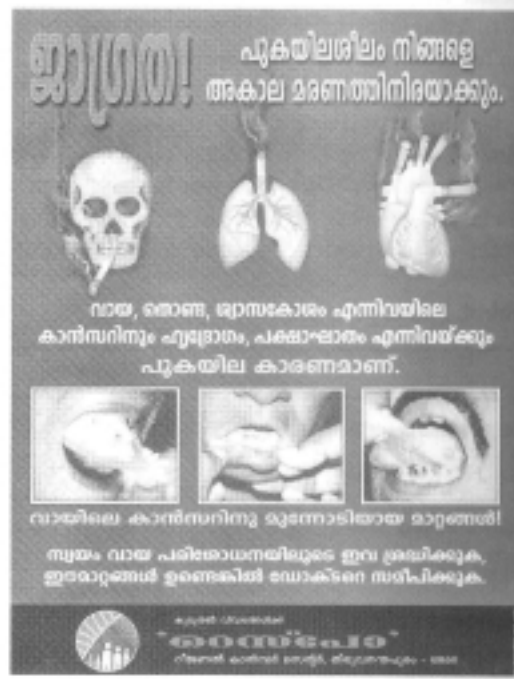
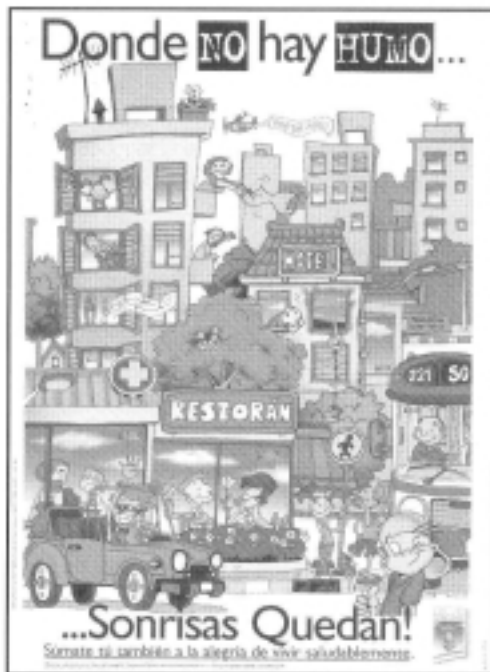


Figure 1. Which is More Effective for Promoting Rejection of the Smoking Habit? (Courtesy of a) the Comision Honoraria De Lucha Contra El Cancer, Montevideo, Uruguay and the Regional Cancer Centre, Division of Cancer Epidemiology Trivandrum, India)

Table 6. Components of a Comprehensive Strategy to Counteract the Ills of Tobacco Consumption

Government Action	Raise tobacco taxes Restrict smoking areas Minimum age purchase laws Counter-advertising in public offices Educate health professionals
NGOs	Support legal challenges Promote research Support community efforts for education and active intervention
Academic Research	Descriptive epidemiology Psychosocial aspects Toxicological pathology

workplace in one study (Nagle et al., 1999).

Regarding restriction on smoking in restaurants, one study in Adelaide, South Australia suggested that whereas only about a quarter of premises had a total smoking ban, even about half those with no restrictions agreed that the government should legislate to this effect (Jones et al., 1999). The extent to which the law defines where smoking is permissible is clearly another area requiring more investigation in relation to prevalence of the habit and disease. Control of this very important parameter and taxation and import policy brings in government policy, and political aspects need commensurate stress as Sombat Chantornvong and Duncan McCargo admirably reviewed for the position in Thailand in a recent issue of *Tobacco Control* (2001).

Strategies for Tobacco Control

In the paper published by Bal et al (2000), the authors start off by stating that tobacco kills more of the US population each year than alcohol, cocaine, heroine, homicide, suicide, car accidents, fires and AIDS combined. If serious measures are not taken now this will be extrapolatable to the vastly greater population in the Asian area within thirty years. The scope of the problem is massive and clearly warrants a broad -based approach to counteract the enormous financial power of the tobacco company lobby (see Table 6).

In addition to action at the government level regarding legislation and education for physicians/nurses, public health authorities, pharmaceutical firms and NGOs clearly need to coordinate their efforts to provide a comprehensive strategy to reduce soking initiation, encourage cessation or reduction in consumption, and combat the adverse physiological effects of tobacco smoke. The research fraternity also has major roles to play in generating a better understanding of disease processes linked to tobacco and psychological and

physical dependence on the habit.

Abstract

Perusal of papers published in the APJCP in 2000, as well as the recent literature from the Asian Pacific countries in general, suggests that whereas the scope of the problem posed by tobacco consumption has received a great deal of attention, we are still lacking detailed data for many countries. The impact of second hand smoke in particular requires further stress. While studies of gene polymorphisms for enzymes involved in carcinogen metabolism have pointed to clearly increased risk of cancer development in many organs for smokers with decreased detoxification potential, the question of how to make best use of this information for practical prevention also remains largely unexplored. Similarly, the fact of peer group and family influence in determining initiation of adolescent smoking has yet to be translated into a concrete strategy based on psychological understanding. Cessation programs for adult smokers on the other hand could make use of the positive results obtained in Japan with intervention married to screening programs for early cancers. Political and socioeconomic questions are clearly very important and putting into action principles of tobacco control efforts with collaboration between all of the interested parties must now be stressed. A Practical Prevention Program (PPP) incorporating anti-smoking measures with a comprehensive pilot scheme for both primary and secondary prevention is proposed for this purpose.

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