

## Lessons from the recent case of CO poisoning due to shisha (hookah, narghile) tobacco smoking in Singapore

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Dear Editors,

In their interesting report, Lim et al. state that shisha CO poisoning is rare in Singapore [1]. The situation is actually the same worldwide. In Saudi Arabia, only 1 shisha smoker out of 24 cases of CO-related intoxications of various origins could be identified [2]. A few years ago, two cases related to hookah lounges were reported in France, a country with a total of about 1,000 neo-Orientalist smoking tea houses by that time [3].

Prevention should focus on the long overdue message that shisha smoking should never take place in poorly ventilated places, particularly when cigarette smoke is simultaneously generated [4]. A recent study from Jordan tends to support this key public health position [5]. Unfortunately, this message was not understood. On the one hand, traditional cafes in the Middle East, Asia and Africa are usually efficiently ventilated, contrary to their counterparts in other parts of the world. On the other hand, one basic difference between the traditional 4-century-old social use of hookah and the contemporary one is the nature of the heating source, which has changed over the last 2 decades from natural charcoal to commercial quick-lighting products [4].

It is unfortunate that Lim et al. did not provide a better description of the conditions in which the poisoning occurred. For instance, where did it take place: at home, in a coffee or tea house, or in the street? Was the place poorly ventilated? Was there simultaneous smoking of cigarettes or other tobacco products (cigars, pipes, etc.)? What about the charcoal and the size of the shisha? Was the

smoking mixture tobamel/moassel (based on molasses and flavors added to the tobacco with no direct contact with the heating source) or jurak (a similar though stronger unflavored product in direct contact with the charcoal)? All these details are of great importance when evaluating the overall contribution to CO. A pioneering study has previously shown that the bigger the hookah is, the lower the amount of CO produced, and the latter also depends on the smoking product itself and the type of charcoal used (commercial vs. natural) [6, 7]. It is likely that in the case report the charcoal was of the quick-lighting type and the smoking mixture tobamel/moassel. However, it is also possible that it was jurak (a very popular product in the Arab-Persian Gulf region) [4] since the patient was said to be of Saudi descent [1].

Comparing the volumes of smoke of both cigarettes and shisha (e.g., 100 or 200 cigarette equivalents) is problematic because in both cases the chemical composition is completely different (number of compounds, water and glycerol proportions, CO and particle concentrations, etc.). This is true for both active and passive smoking. Fortunately, shisha smoke is many times less concentrated in CO than cigarette smoke [3]. Also, exhaled CO measured in non-smokers exposed to hookah smoke virtually does not vary [8]. Unfortunately, a WHO report (not the one cited by Lim et al.) did not distinguish between both kinds of smoke [9]. Only recently have experts acknowledged that “WP [waterpipe] smoking is so different from cigarette smoking that data on smoke composition and toxicity cannot be extrapolated from one to the other.” However, the same tobacco researchers mention, and therefore validate, the yields of toxicants obtained through a “standardized” waterpipe smoking machine study, which is at the very source of the global confusion [9–11].

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Since CO is certainly the most significant risk factor associated with the growing global use of hookahs, I would like to inform Lim et al. of the existence of relevant and sometimes conflicting studies. The first one is about carboxyhemoglobin levels in shisha smokers [12]. Charcoal is known to be the major source of CO. The second study was carried out recently in the USA, but it is not free of biases; for example, only 10 g of the smoking product was used for a whole 60-min session [13]. In fact, in most reliable studies in the Middle East, 20 g is generally used in the shisha bowl [8, 14].

Finally, Lim et al. were right, based on three references (refs. 1, 4, and 5 in their article), to rely on the substantial and impressive 84-page WHO report on shisha smoking [15]. Surprisingly, the authors of the Cochrane Review deemed it not relevant for inclusion in their publication, contrary to the other agency short report advertised as an “Advisory Note” [9, 16, 17].

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