

NICOTINE ADDICTION IN MENTHOL CIGARETTE SMOKERS - WHAT'S NEW?

Henrique Silva^{1,2}

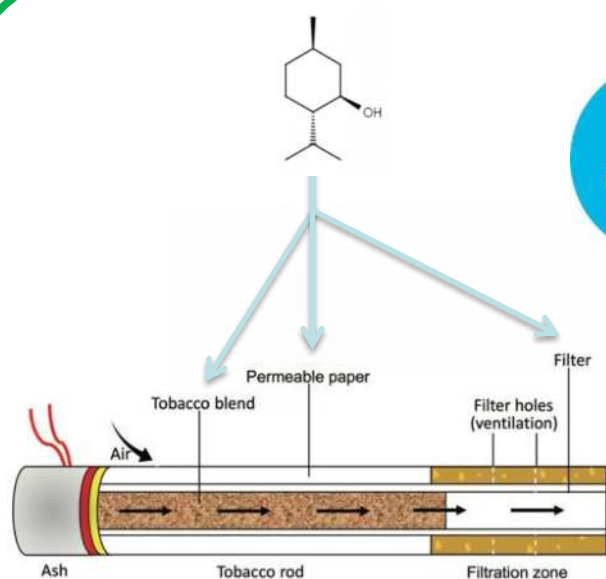
¹ U Lusófona, School of Health Sc. & Technologies, CBIOS (Research Center for Biosciences and Health Technologies), Campo Grande 376, 1749-024, Lisboa, Portugal

² U Lisboa, Faculty of Pharmacy, Pharmacol. Sc Depart - Lisboa, Portugal



The addictive properties of nicotine are largely increased by the many substances added during the processing of tobacco-derived products, such as menthol. Menthol cigarettes (MC) are generally perceived as “safer” than non-menthol cigarettes (NMC), which has led to an increase in tobacco use, especially in teenagers.

This study provides an updated review of the impact of MC smoking on nicotine addiction. Journal papers were searched among the main medical databases through combinations of the following terms: “menthol cigarettes”, “tobacco smoking” and “nicotine addiction”.



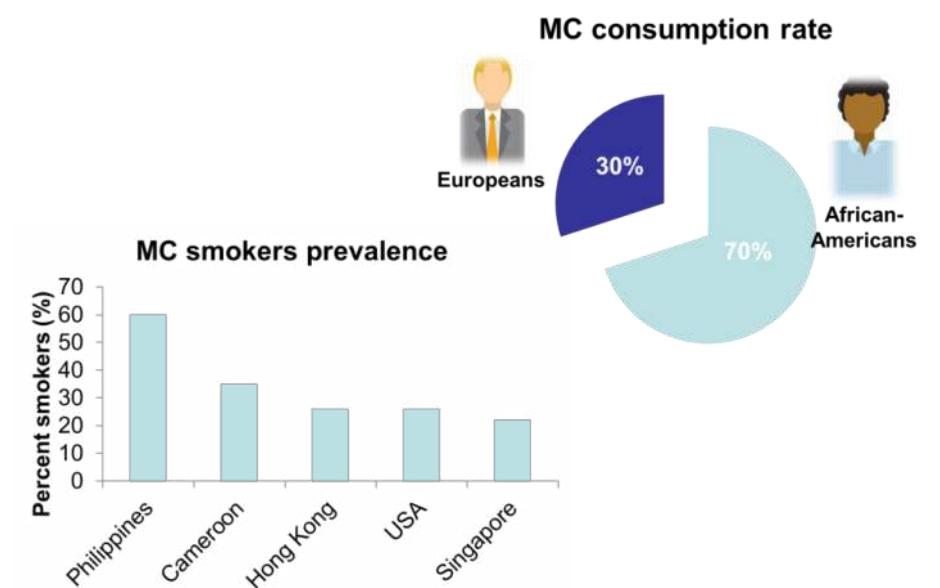
Non-menthol cigarettes (NMC)

0.002–0.07 mg menthol/cigarette
Higher menthol content in lower-yield brands



Menthol cigarette (MC)

2.9–19.6 mg menthol/cigarette



Higher addiction rates have been found in MC smokers compared with NMC smokers, and lower cigarette quitting rates have been found in MC smokers compared with NMC smokers (1-3)



Tobacco industry spent as much or more on magazine advertising for MC as for NMC brands (4)



MC marketing was more frequent in:

- publications and at venues that attracted African-Americans;
- neighborhoods with more African-Americans residents (5)

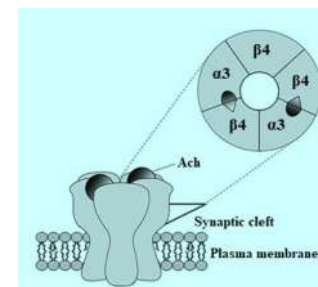


Marketing includes explicit claims, sensory descriptors such as “refreshing”, “clean”, “cool” and “fresh”, together with related imagery to imply that:

- MC are safer and easier to smoke than NMC;
- smoking MC would improve smokers’ health (4,6,7)

MENTHOL INFLUENCES NICOTINE EFFECTS THROUGH OPERANT CONDITIONING

Adolescent rats self-administer more intravenous nicotine when it is accompanied by oral menthol than rats receiving nicotine with a vehicle cue (8)



MENTHOL ACTS ON NICOTINIC ACETYLCHOLINE RECEPTORS (nAChRs)

Menthol promotes the desensitization of the $\alpha3\beta4$ nAChRs in the brain and sensory nerves, as well as promoting $\alpha4\beta2$ upregulation (9)

Menthol could allow MC smokers that are more sensitive to bitterness of nicotine to better tolerate tobacco smoke (4):

- The TAS2R38 gene taster haplotype for bitter substances was found to be inversely associated with nicotine dependence in African-Americans, suggesting that this ethnic group is overall less sensitive to nicotine (10)

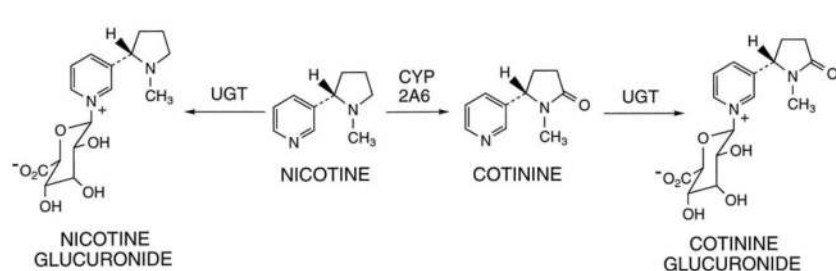
Menthol may attenuate pain perception (i.e. irritation) during smoking by acting on an enkephalin receptor, making MC smokers more tolerant to tobacco smoke:

- A variant of the MRGPRX4 gene is more frequent in African-Americans than in European-Americans (11)

THE EFFECT OF MENTHOL ON THE HEPATIC METABOLISM OF NICOTINE

- Menthol inhibits the oxidative metabolism of nicotine to cotinine and glucuronidation of nicotine (12)

- African-Americans, Asians, Hispanics and people of mixed ethnicity have slower nicotine metabolic rates than European-Americans (1,13,14)



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