

Acute effects of using an electronic nicotine-delivery device (e-cigarette) on myocardial function: comparison with the effects of regular cigarettes

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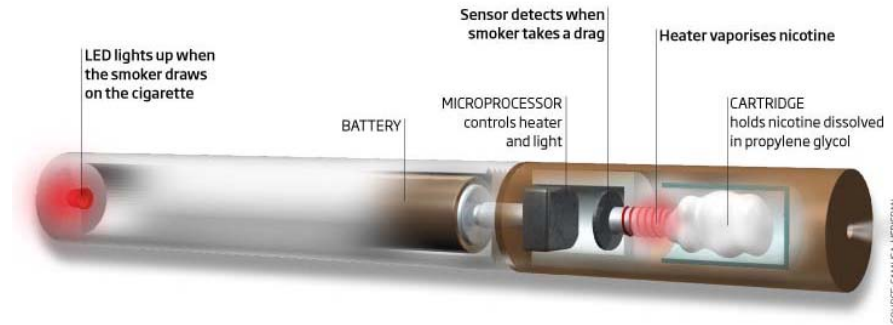
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Conflict of interest: none declared



What is it?



Liquid contents

- Glycerol
- Propylene glycol
- Flavorings
- Nicotine (optional)



Why should we study it?

- Smoking is a major risk factor for cardiovascular disease
- Electronic cigarettes are used by millions of people as an alternative to smoking
- Interesting characteristics: nicotine delivery, dealing with psychological addiction
- Laboratory analysis showed that they are less toxic than cigarettes
- WHO has asked for clinical studies to be performed, because these products should be regulated

First ever study of the effects of electronic cigarettes on cardiac function



Study protocol

◎ Design

Echocardiography: GE VIVID 7, EchoPac

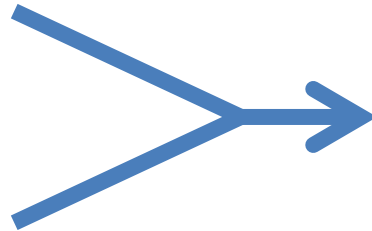
Cigarette used: 1mg nicotine, 10mg tar, 10mg CO

E-cigarette liquid used: 11mg/ml nicotine (**Nobacco**, USA MIX)

Smokers
N=20

e-cigarette
users
N=22

(All had quit smoking for > 1 month)



Haemodynamic
measurements
+
Baseline
echocardiogram



- Smoking 1 cigarette (smokers)
- e-cigarette use for 7 minutes (e-cigarette users)

Haemodynamic
measurements
+
Second
echocardiogram





Smoking vs electronic cigarette

◎ Results - Conclusions

Haemodynamics: significant elevation in **blood pressure and heart rate** (+8% in systolic, +6% in diastolic, +10% in heart rate) after smoking

Slight elevation of **diastolic blood pressure alone (+4%)** after electronic cigarette use

Cardiac function: diastolic function acutely **impaired in smokers (4 parameters adversely affected)**, in agreement with previous studies

No difference in diastolic function observed after electronic cigarette use

Potential mechanisms

Less nicotine absorbed (Bullen et al, Tob Control 2010)

Absence of combustion and different chemical composition, leading to less toxic chemicals created and absorbed

- ✓ Electronic cigarette may be a safer alternative to tobacco cigarettes
- ✓ Substituting tobacco cigarettes with electronic cigarettes may be beneficial to health