

Do e-cigarettes help smokers quit?

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Declaration of interest

- I have no links with any e-cigarette manufacturers
- My research into safety and effects of EC is funded by the National Institute of Health Research, Public Health England, UK Centre for Tobacco and Alcohol Studies and UK Medicines Regulatory Agency

Background

- E-cigarettes (EC) remain a controversial issue. Agendas influence interpretation of evidence and reviews of the same research can arrive at opposite conclusions
- The latest Cochrane review: 2016 (still only two RCTs with long-term outcome – but generated 14 reviews so far)
 - Early EC better than placebo; similar to NRT
 - Low confidence in effect size, but not direction

Contents

- Review main new evidence published over the past two years
- Effects of EC when provided pro-actively in clinical context
- Effects of EC when purchased by smokers

Effects of e-cigarettes (EC) when provided pro-actively

Large RCT that included EC but is difficult to interpret

- N=6,006 smoking employees, opt out or included, had to ask for meds/EC
- Control (texts), 1st gen EC, meds+EC (?), same + 2 types of incentives (paid or not vs up-front sum reduced or not)
- 92% did not order EC and 95% did not order meds (88% and 94% in EC/M+EC arms)
- ‘Did not assess efficacy of use, just the offer’

Large RCT that included EC but is difficult to interpret

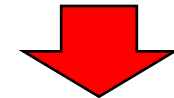
- 6-M quit rates 0.1% control, 1% in EC, 0.5% in meds+EC
- Incentives 2.9%, but repeated blood needed to claim \$600, abstainers from incentives arms could have been more likely to bother
- At 12M: 0%, 0.3%, 0.3%, 1.2% (stats not provided - ?)

Halpern et al. NEJM 2018

Authors prudent: same for meds and EC; did not test use



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Study finds that cash is effective, but e-cigarettes are not in helping smokers quit



E-Cigarettes Don't Help Smokers Quit, But Cash Might

ScienceDaily

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In helping smokers quit, cash is king, e-cigarettes strike out

Study shows financial incentives triple rates of smoking cessation even when all smokers are offered free cessation aids; offering e-cigarettes is not effective at helping people stay smoke-free



Preliminary RCT results

- One year trial; 3M data reported
- N=70 in each condition: Counselling (C), C+EC-N 8mg/ml (?), C+EC-Placebo
- 1st G EC, max 1ml per day (?), not to use others
- ‘Quit rates’ with drop-outs excluded (?), self-reported though CO taken (?)
- **C:10%, EC-P: 23%; EC-N: 25%**

Short-term RCT

- Cartridge EC (Blu)
- N=25:16mg/ml; N=21:24mg/ml; N=22 no EC
- **4M** quit rates: 5% control, 4% EC16, 10% EC22 (NS)
- More self-reported reduction with EC, biomarkers differences large but NS

Small RCT with 6M outcome

- Prior to elective surgery
- N=20 EC (1st gen NJOY), N=10 patches
- Abstinent at 8 weeks (7-day PP, CO validated): 15% vs 0%
- Abstinent at 6M (self-report): 25% vs 10%
- Spirometry at baseline and at 8 weeks: **EC group had significantly greater improvements**

Lee et al. PeerJ 2018

Pre-post cohort 1.

- N=50 smokers with psychosis
- 1st generation disposable EC provided free for 6 weeks, then buying their own
- Asked to replace cigs with EC as much as possible
- Significant reductions in CPD and CO at 4 and at 24 weeks

Hickling et al. Psychological Medicine 2018

Pre-post cohort 2.

- N=72, Blu Pro; 8mg/ml or 16 mg/ml; use ad-lib
- At three months, 32% abstinent
- Significant reductions, but not reported for non-abstainers only

Laboratory studies

- N=28, within-subjects design
- Overnight abstinence, EC 36mg/ml; EC 0mg/ml; no EC
- Nicotine EC relieved craving vs placebo and no EC
- N=12 abstinent for 24h, nicotine EC relieved craving vs placebo EC

Balance of evidence after the new crop of data

- The Cochrane conclusions that EC with nicotine are better than placebo and EC effects are similar to effects of NRT still stand
 - Studies that included other meds reported somewhat better results with EC

Effects of e-cigarettes (EC) when purchased by smokers

Two types of uninformative studies: 1. Failed vapers

- Following Kalkhoran and Glanz 2016, surveys continue to find lower quit rates in vapers unable to quit
 - Wang et al. *Pediatr Res* 2017
 - Weaver et al. *PLoS One* 2018
- Cohorts of smokers unable to quit with EC include heavier smokers with poor prognosis (successful quitters removed)
- See also Villanti et al. *Addiction* 2018 review of methodological problems

Two types of uninformative studies: 2. Treatment failures

- Patients receiving counselling and NRT
- Some tried EC after treatment and were less likely abstinent at 6M than those who did not
- ‘EC may hamper quitting’
- **BUT** treatment successes less likely to try EC, and they form the bulk of quitters
- Analysing only treatment failures, the link disappeared

Treatment failures try EC more than successes: More studies

- Most likely misinterpreting that fact that successful quitters are less likely to use EC post-treatment than those still seeking help
 - ‘EC use was associated with lower quitting than non-use’
Curry et al. NTR 2017
 - Quitline clients, infrequent (but not daily) post-treatment EC use=lower abstinence
Subialka et al. Addict Behav 2018
 - EC use post-treatment ‘associated with less tobacco abstinence’
Rigotti et al. Ann Intern Med 2018

More informative studies

- Cohort studies looking at EC use post-baseline
- Comparing different quit aids on the same metrics
- Even here, self-selection remains an issue

Cohort studies looking at EC use during f-u

- Past year EC use (rather than 'ever'): Significantly increased quit rate.

Zhu et al. BMJ 2017

- Current EC use: Quit rates among daily smokers: 10.6% EC users vs 5% ($p < 0.001$)

Johnson et al. NTR 2018

- Self-selection an issue in the latter, but no sign of EC use undermining quitting

Using EC vs other aids at the last quit attempt 1.

- N=6,112 quit attempters in Italy
- EC 11%, all other aids 3%, no aid 86%
- Quit rates: EC - 8.2%; 'no aid' - 9.4%; 'other aids' - 14.6% (not different from 'no aid' but better than EC)

Gorini et al. Preventive Medicine 2017

Using EC vs other aids in the last quit attempt 2.

- PATH study; N=3,093 quit attempters
- EC the most popular aid (25%)
- Varenicline (6%), bupropion (3%) and NRT (19%)
- EC use improved the chance of success, use of other aids did not

Benmarhnia et al. Am J Epidemiol 2018

Eurobarometer 2017

- 7% of ex-smokers in EU quit with all licensed meds together
- 6% quit with EC

Note

- Some meds promoted in all EU countries for >35 years; EC much newer
 - Duration of abstinence/risk of relapse unclear

Balance of evidence after the new crop of data

- EC are by far the most popular quit aid
- Even assuming they have the same efficacy as other aids, they are helping more people
- Quitting with EC incurs no cost to health care systems