Addiction Research & Therapy

Hajek et al., J Addict Res Ther 2015, 6:3
http://dx.doi.org/10.4172/2155-6105.1000244

Research Article Open Access

# Adding E-Cigarettes to Specialist Stop-Smoking Treatment: City of London Pilot Project

**Hajek P[1], Corbin L[2], Ladmore D[1]* and Spearing E[1]**

[1]*Health and Lifestyle Research Unit & UK Centre for Tobacco and Alcohol Studies, Wolfson Institute of Preventive Medicine, Queen Mary University of London, UK*
[2]*Department of Community and Children's Services, City of London Corporation, UK*

## Abstract

**Rationale:** E-cigarettes (EC) are increasingly popular among smokers who want to limit the risks smoking poses to their health. There is some evidence that they facilitate long-term smoking cessation and are safe to use over short to mid-term. UK stop-smoking service (SSS) which provides free medications and support to smokers seeking help is currently seeing a reduction in the number of clients as rather than attending stop-smoking clinics, smokers prefer to use EC. Stop smoking medications are more effective when used with motivational support than when used unsupported. If SSS included EC in their treatment options, this could improve EC efficacy and enhance SSS reach.

**Setting:** We piloted the inclusion of free EC with 4-week supply of refills in routine SSS treatment offered to smokers living or working in the City of London. Census was taken after 100 smokers were offered EC.

**Results:** The total of 69 (69%) of smokers accepted EC and 45 (65%) of this group achieved biochemically validated abstinence at 4 weeks. Of smokers not accepting the offer of EC, 14 (45%) were validated abstainers at 4 weeks ($X^2$ =3.53, $p$ =.06).

All successful quitters in the EC group reported using EC on most days throughout their quit attempt. Among this group, 31 (45%) smokers did not use or stopped using other stop-smoking medications. Client feedback was highly positive.

Among smokers who accepted EC and achieved abstinence, all used EC at the end of treatment. Smokers using varenicline plus EC had a higher success rate (85%) than smokers using EC only (54%; $X^2$=4.99, $p$=0.03).

**Conclusion:** Offering EC as an addition to the standard stop-smoking service may increase service appeal, cost-effectiveness, and efficacy.

## Introduction

E-cigarettes [EC] are a consumer product which is increasingly popular among smokers who want to limit the risks smoking poses to their health [1]. There remains some controversy over possible effects of EC on 'renormalisation' of nicotine use [2], but they can help smokers quit [3, 4], are safe to use over short to mid-term [3] and even over long term the risks are not expected to exceed 5% of the risks of smoking [5].

Across the UK, Stop Smoking Services [SSS] are currently seeing a reduction in the number of smokers seeking help [6]. One possible explanation of this trend is that rather than attending stop-smoking clinics, smokers prefer to use EC. EC have an advantage over the traditional stop-smoking treatments in that they offer not only nicotine replacement in doses smokers can adjust to their needs, but also sensorimotor replacement and a degree of enjoyment. SSS are being encouraged to consider using e-cigarettes, although these cannot be currently provided on NHS prescription [7].

Nicotine replacement products are more effective when used with motivational support than when used unsupported [8-10] and so it is likely that offering EC with SSS support improves EC efficacy. If SSS started to offer EC, it could attract more smokers to using effective help; and possibly also improve the reach and efficacy of the services.

We piloted the use of EC within a routine stop-smoking service and present our experience and results here as a preliminary report which could be useful to other stop-smoking practitioners.

## Methods

In March 2014 the City of London Corporation in collaboration with the Health and Lifestyle Research Unit at Wolfson Institute of Preventive Medicine at Queen Mary, University of London launched a pilot project offering EC to smokers who access local SSS.

EC was offered to all smokers joining the service in addition to the standard treatment (weekly support and stop smoking medications including NRT and varenicline).

EC and refills were provided for 4 weeks from the target quit day (TQD). Clients could keep EC after this initial period and purchase their own refills. Clients received instructions on how to use their EC and were encouraged to use them ad-lib in addition to the prescribed stop-smoking medications.

### EC offered within the pilot: Brands and cost

Clients were offered a choice of a 'cig-a-like' product, which looks like a cigarette and uses disposable cartridges, or a 'tank' model, which needs to be re-filled with e-liquid. The latter is less user-friendly but can provide better nicotine delivery (11,12). We provided Gamucci cig-a-like (with a choice of 1.6% or 2.2% per ml nicotine) and the

***Corresponding author:** Daniella Ladmore, HAL, 2 Stayner's Road, London E1 4AH. Tel: 02078828232; E-mail: Daniella.ladmore@qmul.ac.uk

**Received** August 17, 2015; **Accepted** September 25, 2015; **Published** September 30, 2015

**Citation:** Hajek P, Corbin L, Ladmore D, Spearing E (2015) Adding E-Cigarettes to Specialist Stop-Smoking Treatment: City of London Pilot Project. J Addict Res Ther 6: 244. doi:10.4172/2155-6105.1000244

**Copyright:** © 2015 Hajek P, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

basic EVOD tank system with 1.8% per ml nicotine e-liquid. Gamucci is a popular middle-of-the-range product and EVOD is a standard refillable product. The EVOD's were later replaced with an Aspire product due to issues with leakage from the cheap EVOD model. The total cost of supplies purchased to provide EC for 120 smokers was £2,995, i.e. £25 per client. (For comparison, in the UK, the cost of 3-months of NRT to the National Health Service (NHS) is about £90 per client with single NRT (SSS typically use two types of NRT concurrently) and the cost of 3-months of varenicline is about £160 per client).

### Definition of abstinence

Abstinence rates were established as per Russell Standard [13] with participants lost to follow-up included as non-abstainers. Self-reported abstinence was biochemically validated via monitoring carbon monoxide (CO) levels in end-expired breath using a cut-off point on 9ppm currently in place within the UK stop-smoking services.

## Results

We collated the results to March 2015 when 100 smokers who accessed the City of London Specialist Stop Smoking Service were offered EC and completed 4-week follow-up. The total of 69 clients (69%) accepted the offer and received an EC on their target quit date (TQD). Table 1 show baseline characteristics of smokers who did and did not accept the offer of EC.

We Did not record the reasons for not wanting EC systematically, but anecdotally, the most frequent explanation was that clients tried EC in the past and did not like them. Other reasons included a concern that EC would remind them of smoking, and media reports suggesting that EC are dangerous.

Among smokers who accepted the EC offer, 47 (68%) reported abstinence from cigarettes at 4 weeks, with 45 (65%) of these self-reports biochemically validated via carbon monoxide (CO) reading in end-expired air of <9ppm. Two clients could not attend the 4-week session and reported abstinence over telephone. Eighteen (26%) smokers given EC did not attend any further sessions and their smoking status and experience with EC could not be established.

Of smokers not accepting the offer of EC, 15 (48%) were abstinent at 4 weeks, with 14 (45%) CO-validated. The difference between the two groups did not reach statistical significance ($X^2$ =3.53, $p$ =.06).

Among 47 smokers who accepted EC and reported abstinence at 4 weeks, all used EC at the end of treatment.

All 69 smokers accepting EC were also offered a choice of NRT and varenicline. 20 opted for varenicline, 23 opted for NRT (20 used single NRT and 6 used NRT combinations), and 26 used EC only. Table 2 shows outcomes of these three groups. Smokers using varenicline plus EC had success rate significantly higher than those using EC only ($X^2$ =4.99, $p$ =0.03).

Among 69 smokers opting for EC, 29 (42%) selected the tank system and 40 (58%) used the cig-a-like product. The abstinence rates in these two groups were 52% and 70%, respectively (NS).

All successful quitters reported using EC on most days throughout their quit attempt. In addition to 26 smokers who did not want any non-EC medication from the start, another 5 stopped using NRT because EC was sufficient to keep them from smoking. No smoker stopped using varenicline.

No problems were reported with having to buy one's own EC supplies at the end of the 4-week period.

### Client feedback

Out of 40 clients who provided formal feedback at 4 weeks, 37 (93%) found EC 'very' or 'extremely' helpful (on the scale 'not at all', 'slightly', 'moderately', 'very' and 'extremely'). Informally, clients often mentioned social situations where other NRT products were seen less efficient in suppressing urges to smoke. Several clients reported that they now recommend EC to smoking friends and family.

Below are two examples of positive feedback written on the evaluation form.

"The Aspire cartomiser provided by your team works very well and at least for me, satisfies social and habitual 'smoking' requirements which led me to fall back into smoking on previous attempts to give up…I would say that both the Blu (purchased earlier) and Aspire are about 80% cheaper than normal cigarettes, health benefits notwithstanding. My occasional asthma and use of Salbutamol

| | Accepted EC (N=69) | Did not accept EC (N=31) | Difference |
|---|---|---|---|
| Women N (%) | 26 (38%) | 17 (55%) | NS |
| Age in years (SD) | 41.8±11.6 | 39±9.2 | NS |
| Cigarettes per-day | 13.6±6.7 | 14.2±8.3 | NS |
| Smoking within 30 mins of waking up N (%) | 44 (64%) | 18 (58%) | NS |
| Married/living with spouse N (%) | 35 (51%) | 15 (48%) | NS |
| Secondary education and above N (%) | 50 (72%) | 22 (71%) | NS |
| Opted for NRT N (%) | 23 (33%) | 14 (45%) | NS |
| Opted for varenicline N (%) | 20 (29%) | 17 (55%) | $X^2$=6.13, p=0.01 |
| Opted for EC only N (%) * | 26 (38%) | | |

* 26 smokers accepting EC decided to wait to see whether they need NRT later as well; none did

**Table 1:** Baseline characteristics.

| | % quit at 4 weeks | % smoking at 4 weeks | % lost to follow-up |
|---|---|---|---|
| EC+ varenicline (N=20) | 17 (85%) | 0% | 3 (15%) |
| EC+NRT (N=23) | 14 (61%) | 5 (22%) | 4 (17%) |
| EC Only (N=26) | 14 (54%) | 1 (4%) | 11 (42%) |

*Two smokers claiming abstinence over the phone who did not attend for CO validation are counted as non-abstainers

**Table 2:** Validated quit rates* in smokers using EC with and without other medications.

inhalers has dropped by at least 50% I would say if not more" *Male, 46, Aspire User Only.*

"10 times better than patches" *Female, 58, Gamucci User Only.*

It is however important to note that end-of-treatment feedback has limited value in smoking cessation as only successful clients tend to complete the course.

Client feedback also identified some problems. One was poor battery life and leakage with the cheap basic EVOD model, mostly resolved by switching to the Aspire product. Nine EVOD's and one Gamucci had to be replaced. Another issue was getting hold of refills. We provided addresses of on-line suppliers, but smokers preferred to purchase cartridges and e-liquids without waiting for mail delivery. There were only a few EC outlets available and products there were more expensive than on-line.

### Adverse reactions

There was one incident of a leak from EVOD irritating client's mouth, including a burning lip sensation and a minor skin peel. The client did not seek any medical treatment and the problem was resolved by washing the lip with water.

There were also some reports of irritation at the back of the throat (which some smokers liked) and minor coughing. This corresponds with known side effects of EC use and it is in line with common side effects of using oral NRT.

## Discussion and Conclusions

Most (69%) of the clients offered EC were interested in using them. Clients who accepted EC had higher validated 4-week quit rate than those who refused the offer (65% vs 45%), but the difference did not reach statistical significance.

Across the UK specialist stop-smoking services, the current CO-validated quit rate is 38% [6]. Adding EC to standard treatment certainly did not reduce treatment efficacy and may have increased it. This positive outcome tallies with previous cohort studies which reported encouraging effects of EC use even in hard-to-reach groups including smokers not intending to quit [9] and schizophrenic patients [10].

Providing free EC for four weeks did not increase service costs and in fact generated savings because a proportion of smokers who opted for EC did not use the more expensive standard stop-smoking medications.

The present pilot project has its limitations. The sample size was relatively small, smokers self-selected EC use, and we monitored only short-term 4-week outcomes as per standard SSS reporting. It is possible that on-going EC use may prevent relapse to smoking, which is otherwise the most frequent long-term outcome among successful short-term quitters. There is some evidence suggesting that extended use of NRT improves outcomes [14-19] and smokers report that EC is more enjoyable to use than NRT [20] and so may be used for longer, but more data on long-term outcomes are needed.

Among smokers using EC, those who also used varenicline had significantly higher quit rates than those who used EC only. The four week quit rate of 85% is in fact unusually high. Three studies examined a combination of varenicline and nicotine patches, with two finding no effect [15,6] and one yielding a positive result [17]. The positive trial however included the use of patches for two weeks prior to the target quit date and so the finding may have reflected an NRT preloading effect [18] rather than an effect of NRT + varenicline combination. In contrast to patches which provide no subjective effects, EC offer sensorimotor replacement for cigarettes and a degree of reward. It is possible that a combination of varenicline blunting the desire to smoke and EC providing a behavioural coping strategy and a degree of enjoyment may be particularly effective. Our finding is based on only a subsample of 20 smokers, but it suggests that a combination of varenicline and EC warrants further examination in a placebo-controlled trial.

In summary, offering EC as an addition to the standard specialist service may increase service appeal, cost-effectiveness and efficacy.

### Financial Support

The pilot study was sponsored by City of London Corporation

### Conflicts of interest

Peter Hajek received research funds from and provided consultancy to manufacturers of smoking cessation medications. The remaining authors have no conflicts of interest to declare.

### Reference

1. Hajek P, Etter JF, Benowitz N, Eissenberg T, McRobbie H (2014) Electronic cigarettes: review of use, content, safety, effects on smokers and potential for harm and benefit. Addiction 109: 1801-1810.
2. http://www.who.int/fctc/cop/sessions/COP6_report_FINAL_04122014.pdf?ua=1
3. McRobbie H1, Bullen C, Hartmann-Boyce J, Hajek P (2014) Electronic cigarettes for smoking cessation and reduction. Cochrane Database Syst Rev 12: CD010216.
4. http://www.smokinginengland.info/latest-statistics/
5. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/454517/Ecigarettes_a_firm_foundation_for_evidence_based_policy_and_practice.pdf
6. NHS Stop Smoking Services: England April 2013 to March 2014 HSCIC, Aug. 2014
7. National Centre for Smoking Cessation and Training in Partnership with Public Health England (2014). Local stop smoking services: Service and delivery guidance. ISBN 978-0-9565243-3-1
8. Kotz D, Brown J, West R (2014) 'Real-world' effectiveness of smoking cessation treatments: a population study. Addiction 109: 491-499.
9. Polosa R, Caponnetto P, Maglia M, Morjaria JB, Russo C (2014) Success rates with nicotine personal vaporizers: a prospective 6-month pilot study of smokers not intending to quit. BMC Public Health 14: 1159.
10. Caponnetto P, Auditore R, Russo C, Cappello GC, Polosa R (2013) Impact of an electronic cigarette on smoking reduction and cessation in schizophrenic smokers: a prospective 12-month pilot study. Int J Environ Res Public Health 10: 446-461.
11. Farsalinos KE, Spyrou A, Tsimopoulou K, Stefopoulos C,Romagna G, Voudris V (2014) Nicotine absorption from electronic cigarette use: comparison between first and new-generation devices. Scientific Reports 4, Article number: 4133.
12. Lechner W, Meier E, Wiener J, Grant D, Gilmore J, et al. (2015) The comparative efficacy of first- versus second-generation electronic cigarettes in reducing symptoms of nicotine withdrawal. Addiction 110:862-7.
13. West R, Hajek P, Stead L, Stapleton J (2005) Outcome criteria in smoking cessation trials: the need for a common standard. Addiction, 100, 299-303
14. Lifestyle Statistics Team. Statistics on NHS Stop Smoking Services in England 1 April 2013 to 31 March 2014. Health and Social Care Information Centre, London 2014
15. Hajek P, Smith KM, Dhanji AR, McRobbie H (2013) Is a combination of varenicline and nicotine patch more effective in helping smokers quit than varenicline alone? A randomised controlled trial. BMC Med 11: 140.
16. Ramon JM, Morchon S, Baena A, Masuet-Aumatell C (2014) Combining varenicline and nicotine patches: a randomized controlled trial study in smoking cessation. BMC Med 12: 172.

17. Koegelenberg CF, Noor F1, Bateman ED2, van Zyl-Smit RN2, Bruning A3, et al. (2014) Efficacy of varenicline combined with nicotine replacement therapy vs varenicline alone for smoking cessation: a randomized clinical trial. JAMA 312: 155-161.

18. Rose JE (2011) Nicotine preloading: the importance of a pre-cessation reduction in smoking behavior. Psychopharmacology (Berl) 217: 453-454.

19. Hajek P, McRobbie H, Gillison F (2007) Dependence potential of nicotine replacement treatments: effects of product type, patient characteristics, and cost to user. Prev Med 44: 230-234.

20. Bullen C, Howe C, Laugesen M, McRobbie H, Parag V, et al. (2013) Electronic cigarettes for smoking cessation: a randomised controlled trial. Lancet 382: 1629-1637.

**Citation:** Hajek P, Corbin L, Ladmore D, Spearing E (2015) Adding E-Cigarettes to Specialist Stop-Smoking Treatment: City of London Pilot Project. J Addict Res Ther 6: 244. doi:10.4172/2155-6105.1000244

**OMICS International: Publication Benefits & Features**

**Unique features:**

- Increased global visibility of articles through worldwide distribution and indexing
- Showcasing recent research output in a timely and updated manner
- Special issues on the current trends of scientific research

**Special features:**

- 700 Open Access Journals
- 50,000 editorial team
- Rapid review process
- Quality and quick editorial, review and publication processing
- Indexing at PubMed (partial), Scopus, EBSCO, Index Copernicus and Google Scholar etc
- Sharing Option: Social Networking Enabled
- Authors, Reviewers and Editors rewarded with online Scientific Credits
- Better discount for your subsequent articles

Submit your manuscript at: http://www.omicsonline.org/submission/