

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Cytisine for Smoking Cessation: Clinical Effectiveness and Cost- Effectiveness

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Research Questions

1. What is the clinical effectiveness of cytisine for the treatment of smoking cessation?
2. What is the cost-effectiveness of cytisine for the treatment of smoking cessation?

Key Findings

One health technology assessment, four systematic reviews (including two with meta-analyses and one with an economic evaluation), and two randomized controlled trials were identified regarding the clinical effectiveness of cytisine for the treatment of smoking cessation.

Methods

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2007 and August 29, 2017. Internet links were provided where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Individuals of any age who smoke
Intervention	Cytisine
Comparators	Q1-2: Nicotine replacement therapy (NRT) – any form; Varenicline; Bupropion; Placebo
Outcomes	Q1: Clinical effectiveness (e.g., reduction in smoking, improved quality of life) and safety (patient harms and benefits) Q2: Cost-effectiveness (e.g., cost per QALY increase, cost per benefit)
Study Designs	Health technology assessment, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and economic evaluations.

One health technology assessment, four systematic reviews (including two with meta-analyses and one with an economic evaluation), and two randomized controlled trials were identified regarding the clinical effectiveness of cytisine for the treatment of smoking cessation.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One health technology assessment,¹ four systematic reviews (SR)²⁻⁵ (including two with meta-analyses⁴⁻⁵ and one with an economic evaluation³), and two randomized controlled trials⁶⁻⁷ were identified regarding the clinical effectiveness of cytisine for the treatment of smoking cessation.

The health technology assessment¹ concluded that there is limited evidence on cytisine and its effectiveness as an aid to smoking cessation. One SR² reported that cytisine increased the chances of quitting, but absolute quit rates were modest in recent trials. One SR³ and one randomized controlled trial⁷ concluded that cytisine was more effective than placebo as an aid in smoking cessation. Another SR⁴ reported that cytisine improved the chances of smoking cessation. The final identified SR⁵ concluded that cytisine was an effective treatment for smoking cessation and was comparable in efficacy to other licensed treatments. The other identified randomized controlled trial⁶ reported that, when cytisine was combined with behavioural support, it was superior to nicotine-replacement therapy in smoking cessation; however, it had more self-reported adverse events. The SR with economic evaluation³ concluded that cytisine was anticipated to dominate varenicline, in that it produced more quality-adjusted life-years at a lower associated cost.

References Summarized

Health Technology Assessments

1. Medical Advisory Secretariat. Population-based smoking cessation strategies: a summary of a select group of evidence-based reviews. Ontario Health Technology Assessment Series [Internet]. 2010 [cited 2017 Aug 30];10(1). Available from: http://www.hqontario.ca/Portals/0/Documents/evidence/reports/rev_smoking_20100114.pdf
See: Results, page 34;
Authors' Conclusions, sixth bullet, page 35

Systematic Reviews and Meta-analyses

2. Cahill K, Lindson-Hawley N, Thomas KH, Fanshawe TR, Lancaster T. Nicotine receptor partial agonists for smoking cessation. Cochrane Database Syst Rev. 2016 May

9;(5):CD006103.

[PubMed: PM27158893](#)

3. Leaviss J, Sullivan W, Ren S, Everson-Hock E, Stevenson M, Stevens JW, et al. What is the clinical effectiveness and cost-effectiveness of cytisine compared with varenicline for smoking cessation? A systematic review and economic evaluation. Health Technol Assess [Internet]. 2014 May [cited 2017 Aug 30];18(33):1-120. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4780997>
[PubMed: PM24831822](#)
4. Cahill K, Stevens S, Perera R, Lancaster T. Pharmacological interventions for smoking cessation: an overview and network meta-analysis. Cochrane Database Syst Rev. 2013 May 31;(5):CD009329.
[PubMed: PM23728690](#)
5. Hajek P, McRobbie H, Myers K. Efficacy of cytisine in helping smokers quit: systematic review and meta-analysis. Thorax. 2013 Nov;68(11):1037-42.
[PubMed: PM23404838](#)

Randomized Controlled Trials

6. Walker N, Howe C, Glover M, McRobbie H, Barnes J, Nosa V, et al. Cytisine versus nicotine for smoking cessation. N Engl J Med. 2014 Dec 18;371(25):2353-62.
[PubMed: PM25517706](#)
7. West R, Zatonski W, Cedzynska M, Lewandowska D, Pazik J, Aveyard P, et al. Placebo-controlled trial of cytisine for smoking cessation. N Engl J Med. 2011 Sep 29;365(13):1193-200.
[PubMed: PM21991893](#)

Non-Randomized Studies

No literature identified.

Economic Evaluations

No literature identified.

Appendix — Further Information

Review Articles

8. Mulhall A, Cole A, Patel S. Efficacy and Safety of Nintedanib in Idiopathic Pulmonary Fibrosis, Cytisine versus Nicotine for Smoking Cessation, and FACED Score for Non-Cystic Fibrosis Bronchiectasis. *Am J Respir Crit Care Med*. 2015 Jul 15;192(2):249-51. [PubMed: PM26177172](#)
9. West R, Raw M, McNeill A, Stead L, Aveyard P, Bitton J, et al. Health-care interventions to promote and assist tobacco cessation: a review of efficacy, effectiveness and affordability for use in national guideline development. *Addiction* [Internet]. 2015 Sep [cited 2017 Aug 30];110(9):1388-403. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4737108>
[PubMed: PM26031929](#)
10. Le Houezec J, Aubin HJ. Pharmacotherapies and harm-reduction options for the treatment of tobacco dependence. *Expert Opin Pharmacother*. 2013 Oct;14(14):1959-67. [PubMed: PM23978314](#)

Additional References

11. West R, Coyle K, Owen L, Coyle D, Pokhrel S, EQUIPT Study Group. Estimates of effectiveness and reach for 'return on investment' modelling of smoking cessation interventions using data from England. *Addiction*. 2017 Aug 18. [PubMed: PM28833834](#)