Pharmacotherapy for Smoking Cessation: A Systematic Review and Network Meta-Analysis

Prepared by the CIHR/DSEN-funded Canadian Collaboration for Network Meta-Analysis (ccNMA)

Background

As part of the evaluation of the BC Smoking Cessation Program, the Ministry of Health requested that the CIHR-Drug Safety and Effectiveness Network (DSEN) conduct a comparative analysis of the effectiveness and safety of drug and non-drug therapies for smoking cessation.

Following a period of query refinement, topic prioritization and funding approval by the CIHR-DSEN program, a project plan was finalized to assess the comparative efficacy and safety of the pharmacotherapies for smoking cessation (with and without an active behavioural support program). A broader DSEN-funded smoking cessation research program will also study behavioural support interventions alone and further examine which behavioural support interventions combined with which pharmacological therapies are most clinically efficacious.

Pharmacologic Aids for Smoking Cessation

Prescription pharmacologic agents: bupropion (Zyban® version only) and varenicline (Champix®)

Nicotine replacement therapies (NRT): chewing gum (Thrive™) and patches (Habitrol®).

Methods

The strategy for building and analyzing the evidence base for pharmacotherapies for smoking cessation included two fundamental steps:

1. A **broad systematic review** of randomized trial evidence in the published literature for the outcomes specified in the study protocol following the methods and procedures of the Cochrane Collaboration (literature search current to November 18, 2013).
2. A pair-wise meta-analysis and **Bayesian network meta-analysis** (NMA) of the randomized evidence was conducted connecting the pharmacologic interventions (with and without active behavioural support programs) in a network for each of the outcomes specified a priori (biochemically verified smoking cessation at12 and greater than 12 months, cardiovascular death, myocardial infarction, stroke, transient ischemic attack (TIA) , suicidal ideation, completed suicide, treatment-emergent aggression).

KEY MESSAGES

For the selected pharmacotherapies that correspond to those that are covered, or provided with no cost access, under the BC Smoking Cessation Program:

- The continuous abstinence rate (CAR) at 12 months was significantly better for the pharmacotherapies considered (namely: bupropion 150 mg bid, varenicline 1 mg bid and nicotine gum 2mg) compared to placebo
- CAR at 12 months was significantly better for the pharmacotherapies considered (namely: bupropion 150 mg bid, varenicline 1 mg bid, nicotine gum 2mg and nicotine patch 21 mg) plus an active behavior support program compared to an active behavior support program on its own.
- The continuous abstinence rate at 12 months was significantly better for varenicline 1 mg bid with an active behavior support program then for the other pharmacotherapies considered (namely: bupropion 150 mg bid, nicotine gum 2 and nicotine patch 21 mg) with an active behavior support program.
- No safety signal for cardiovascular events or suicides was indentified, however, results should be interpreted with caution given the small number of trials reporting these outcomes and the low number of events available for analysis.

To view references for this document or the full scientific report, go to:
http://www.ottawaheart.ca/research_discovery/cardiovascular-research-methods-centre.htm

Research Results

- 1,560 full-text articles were assessed for eligibility by two independent clinical reviewers and 192 publications were included describing 183 unique randomized controlled trials reporting on varenicline, bupropion and NRTs.
- Data were sufficient for NMA to be conducted for two efficacy outcomes (continuous abstinence rate at 12 and >12 months) and two safety outcomes (myocardial infarction, suicidal ideation). The choice of these outcomes for NMA was based on sufficiency of the data available to derive robust and consistent network models.
- Narrative summaries and meta-analyses (if appropriate) were provided for other study outcomes, including cardiovascular death, stroke, TIA, completed suicides, aggression).