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# **Benzodiazepine discontinuation among community-dwelling older people: a population-based cohort study**

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*To the Editor:* Long-term use of benzodiazepines has been associated with advancing age, female gender, depression and use of >2 other prescription drugs [1-3]. Discontinuing benzodiazepines may improve body stability and daytime cognition without causing distressing withdrawal symptoms or emergent sleep difficulties [4-6]. The objective of this study was to investigate benzodiazepine discontinuation in the municipality of Leppävirta, located in Eastern Finland, from 2006-2008.

The study sample comprised all community-dwelling people aged  $\geq 65$  years ( $n=2415$ ) in Leppävirta on August 31, 2006. Records of reimbursed drug purchases for 2006-2008 were extracted from the Finnish National Prescription Register maintained by the Social Insurance Institution of Finland (SII) [7]. Drugs were categorized using the Anatomical Therapeutic Chemical classification system. Benzodiazepines were defined as anxiolytics (N05B) and hypnotics and sedatives (N05C), which included zopiclone, zolpidem and zaleplon (N05CF). Patient diagnoses were extracted from the Special Reimbursement Register maintained by the SII. Diagnoses included endocrine disorders (diabetes, hypothyroidism), mental and neurological disorders (depression, epilepsy, psychosis, Alzheimer's disease, Parkinson's disease), cardiovascular disease (heart failure, hypertension, coronary artery disease, arrhythmias), respiratory disease (asthma, COPD) and musculoskeletal disorders (connective tissue injury, rheumatoid arthritis). Benzodiazepine use at baseline was defined as receipt of  $\geq 1$  prescriptions for benzodiazepines in the six-months until August 31, 2006. Benzodiazepine use at follow-up was defined as receipt of  $\geq 1$  prescriptions for benzodiazepines in the six-months until August 31, 2008. Logistic regression was used to investigate factors associated with benzodiazepine discontinuation between baseline and follow-up. To investigate the possible impact of patients being eligible for drug reimbursements in 2006 but not in 2008 sensitivity analyses were also performed excluding persons who received 3+ prescriptions in 2006 but zero prescriptions in 2008.

Among all people aged  $\geq 65$  years ( $n=2415$ ), 346 (14.3%) people received  $\geq 1$  prescriptions benzodiazepines in the six-months until August 31, 2006. Of these 346 people, 311 were also alive in August 2008. Baseline diagnoses among these 311 people included 57 (18.3%) endocrine disorders, 50 (16.1%) mental or neurological disorders, 171 (55.0%) cardiovascular disease, 11 (3.5%) musculoskeletal disorders, 34 (10.9%) respiratory disorders and 15 (4.8%) cancer. At baseline, 193 (62.1%) people received reimbursement for  $\geq 5$  different prescription drugs in the six-months until August 31, 2006. Of the 311 people, 168 (54.0%) also received  $\geq 1$  prescriptions for benzodiazepines in the six-month period until August 31, 2008. Age 85+ years was significantly

associated with benzodiazepine discontinuation in the multivariate analyses (Table 1). This remained significant in univariate (odds ratio [OR] 2.31, 95% confidence interval (CI) 1.09-4.87) and multivariate (OR 2.20, 95%CI 1.02-4.77) analyses when excluding persons who received 3+ prescriptions in 2006 but zero prescriptions in 2008.

Forty-six percent benzodiazepine users in 2006 were categorized as non-users at the two-year follow-up, with benzodiazepine discontinuation associated age 85+ years. The high rate of discontinuation among the oldest old is encouraging because previous studies have reported that increasing age is associated with long-term benzodiazepine use [1, 2]. Unlike in previous studies female sex, mental or neurological disorders and use of other prescription drugs were not associated with long-term use [1-3]. A strength of the study was that the Prescription Register included all reimbursed drug purchases for all residents in non-institutional settings. However, not all brands of small packs of benzodiazepines were reimbursed by the SII [8]. In conclusion, our results challenge the popular misconception that discontinuation is too difficult among the oldest old.

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Table 1. Factors associated with benzodiazepine discontinuation

	Unadjusted OR	Adjusted OR*
Baseline age		
65-74	1.00	1.00
75-84	1.35 (0.83-2.17)	1.37 (0.84-2.24)
85+	2.26 (1.09-4.70)	2.18 (1.03-4.64)
Female sex	1.46 (0.91-2.33)	1.38 (0.85-2.24)
Baseline diagnoses		
Endocrine disorder	0.69 (0.38-1.24)	0.67 (0.36-1.25)
Mental or neurological disorder	0.75 (0.40-1.39)	0.76 (0.41-1.43)
Cardiovascular disease	0.97 (0.62-1.52)	0.89 (0.52-1.51)
Musculoskeletal disorder	1.43 (0.43-4.78)	1.46 (0.43-4.97)
Respiratory disorder	1.20 (0.59-2.44)	1.18 (0.56-2.48)
Cancer	0.77 (0.27-2.23)	0.77 (0.26-2.30)
Use of >5 other prescription drugs	1.13 (0.72-1.79)	1.20 (0.70-2.06)

\*Adjusted for age, sex, baseline diagnoses and use of >5 other prescription drugs

OR=Odds Ratio