

Obstructive Sleep Apnea is Not a Risk Factor for Incident Hospitalized Depression: A Historical Cohort Study

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Table E1. List of variables collected in sleep laboratory (each patient in the cohort underwent an overnight full standard polysomnography recording which was scored manually by a sleep technologist and reviewed by a board-certified sleep physician).

Name	Description	Measurement
Demographic characteristics (self-reported by patients)		
Sex		Male/Female
Age		years
Symptoms related to OSA (self-reported by patients)		
<i>Daytime sleepiness</i>		
Epworth Sleepiness Scale, total	Total score	ranged from 0 to 24
Item #1	Sitting and reading	0 = would never doze 1 = slight chance of dozing 2 = moderate chance of dozing 3 = high chance of dozing
Item #2	Watching TV	from 0 to 3
Item #3	Sitting inactive in a public place (e.g. a theatre or at a meeting)	from 0 to 3
Item #4	As a passenger in a car for an hour without a break	from 0 to 3
Item #5	Lying down in the afternoon when circumstances permit	from 0 to 3
Item #6	Sitting and talking to someone	from 0 to 3
Item #7	Sitting quietly after a lunch without alcohol	from 0 to 3
Item #8	In a car while stopped for a few minutes in traffic	from 0 to 3
Self-reported DS	"During the day, do you ever fall asleep unintentionally?"	Yes/No
<i>Other symptoms</i>		
Self-reported snoring	Do you snore?	Yes/No
Observed cessation of breathing	Has anyone ever told you that you stop breathing while you sleep?	Yes/No
Observed restless sleeper	Have you been told that you are a restless sleeper?	Yes/No
Wake unrefreshed	Do you feel refreshed when you wake up?	Yes/No
Self-reported morning headache	Do you often wake up with headaches in the morning?	Yes/No
Memory and concentration impact	Do you have trouble concentrating or remembering things?	Y/N
Social History (self-reported by patients)		
Smoking status		current ex-smoker never
Alcohol consumption	"Y" > 7 alcoholic beverages per week, other - "N"	Yes/No
Employment status	Are you currently working?	Yes/No
Self-reported medical history at baseline		
SR HiBP	Do you, or have you ever suffered from high blood pressure?	Yes/No
SR MI	Self-reported myocardial infarction	Yes/No
SR Stroke	Self-reported stroke	Yes/No
Use of hypnotic medications	Do you ever take medication to help you fall asleep?	Yes/No
Self-reported Family History		
History of Family Snore	Does anybody else in your family snore loudly?	Yes/No
History of Family Apnea Diagnosis	Has anyone in your family been diagnosed with sleep apnea?	Yes/No
Physical examination by sleep technician according to the lab manual		
WGT	weight	kg
HGT	Height	cm

NECK	neck circumference	cm
WAIST	waist circumference	cm
HIP	hip circumference	cm
PSG recording: PSG software used is different version of Sandman (current - 7.3)		
TST	Time in Bed (TIB) – Sleep Latency (SL)	hours
Sleep efficiency	TST/TIB	%
STAGE1 PER	The PSG was scored manually for sleep stage according to established criteria using the EEC, EOG and EMG records ¹ .	% of stage 1
STAGE2 PER		% of stage 2
STAGE3 PER		% of stage 3
STAGE4 PER		% of stage 4
REM PER		% of REM
HRMEAN TST	Overall mean heart rate in TST	bpm
PLMI TST	The number of periodic leg movements per hour of TST	events/hr.
ArI, total	Total Arousals index in TST	events/hr.
AWK TST	Total Awakenings, number in TST	events/TST
MEANO2SAT_TST	Overall Mean SaO ₂ % in TST	%
O2SAT90MIN_TST	Duration of SaO ₂ <90% in TST	minutes
ProcSat_less90TST	% of SaO ₂ <90%, in TST	%
Apnea and hypopnea events		
Obstructive apnea/hypopnea event	Must fulfill criterion 1 or 2, plus criterion 3 of the following ² : 1. A clear decrease (>50%) from baseline in the amplitude of a valid measure of breathing during sleep. Baseline is defined as the mean amplitude of stable breathing and oxygenation in the two minutes preceding onset of the event (in individuals who have a stable breathing pattern during sleep) or the mean amplitude of the three largest breaths in the two minutes preceding onset of the event (in individuals without a stable breathing pattern). 2. A clear amplitude reduction of a validated measure of breathing during sleep that does not reach the above criterion but is associated with either an oxygen desaturation of >3% or an arousal. 3. The event lasts 10 seconds or longer	
ApnOI TST	Obstructive apnea Index in TST	events/hr.
ApnTotI TST	Total apnea Index in TST	events/hr.
HypOI TST	Obstructive hypopneas Index in TST	events/hr.
HypTotI TST	Total hypopneas Index in TST	events/hr.
AHIO TST	Obstructive apnea-hypopneas Index in TST	events/hr.
AHIO NREM	Obstructive apnea-hypopneas Index in NREM	events/hr.
AHIO REM	Obstructive apnea-hypopneas Index in REM	events/hr.
AHI TST	Total apnea-hypopneas Index in TST	events/hr.
AHITot NREM	Total apnea-hypopneas Index in NREM	events/hr.
AHITot REM	Total apnea-hypopneas Index in REM	events/hr.
AHDUR MEAN	Total apnea-hypopneas, Mean Duration	min
AHDUR MAX	Total apnea-hypopneas, Longest Event	min

Table E2. Description of codes used to define hospitalization for depression from health administrative data.

DSM-IV	Description	ICD-9	Description	ICD-10	Description
				F20.4	Post-schizophrenic depression
296.2	Major depressive disorder, single episode	296.2	Major depressive disorder single, episode	F32.x	Depressive episode
296.3	Major depressive disorder, recurrent	296.3	Major depressive disorder, recurrent episode	F33.x	Recurrent depressive disorder
296.5	Bipolar I disorder, most recent episode depressed	296.5	Bipolar affective disorder, depressed	F31.3-F31.5	Bipolar affective disorder, current episode depression
300.4	Dysthymic disorder	300.4	Neurotic depression	F34.1	Dysthymia
309.0	Adjustment disorder with depressed mood	309.0	Brief depressive reaction	F43.2	Adjustment disorders
309.28	Adjustment disorder with mixed anxiety and depressed mood				
311	Depressive disorder NOS	311	Depressive disorder, not elsewhere classified		

DSM-IV - the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; ICD - International Classification of Diseases.

Table E3. Information about variables derived from health administrative data.

Risk factors and other potential confounders	ICES-derived Cohorts/ Acquired Cohorts / Registries
Prior CV diseases	Based on ICD-9, ICD-10 and OHIP codes for combination of inpatient and outpatient visits for any of the following CV diseases: myocardial infarction, bypass surgery or cardiac stent variables, heart failure and stroke in CIHI/DAD, NACRS or OHIP associated with ED visits.
Prior hypertension	Ontario Hypertension Database ³
Prior CHF	Ontario Congestive Heart Failure Database
Prior diabetes	Ontario Diabetes Dataset ⁴
Prior COPD	Chronic Obstructive Pulmonary Disease Database ⁵
Prior cancer	Ontario Cancer Registry Database ⁶
Prior dementia	The presence of dementia defined based on ICD-9, ICD-10 and OHIP codes in CIHI/DAD, NACRS or OHIP.
Comorbidities at baseline in the last 2 years	Using Hopkins Adjusted Diagnostic Groups (ADGs) ^{7,8} : 34 diagnosis clusters known as ADGs based on diagnostic certainty, disease duration, severity, etiology, and care involvement. <ul style="list-style-type: none"> • Low comorbidity: 0-5 ADGs • Moderate comorbidity: 6-9 ADGs • High comorbidity: ≥ 10 ADGs Classification of comorbidities based on ADGs had been shown accurate for prediction of one-year mortality in subpopulations with chronic diseases including diabetes. So this is a different way on evaluation effect of comorbidities, more from health care utilization perspective.
Alcoholism	Based on ICD-9 and ICD-10 codes for: alcohol dependence, alcohol intoxication, alcohol abuse, and alcohol-induced disorder in CIHI/DAD.
Sociodemographic characteristics at baseline	
Urban/rural status	<i>Urban/rural status</i> at time of index diagnostic sleep study was defined using patient's postal code ⁹ .
Income Status	Ontario neighbourhoods are classified into one of the five approximately equal-sized income quintiles, ranked from poorest (Q1) to wealthiest (Q5) and these have been shown to be related to population health status and health care utilization ¹⁰ . Each patient was assigned to the income quintile based on the patient's postal code at the time of index date and Statistics Canada's Postal Code Conversion File ^{11,12} .

List of datasets used: The Registered Persons Database (RPDB), Canadian Institute for Health Information Discharge Abstract database (CIHI-DAD) and the Same Day Surgery (CIHI-SDS), Ontario Health Insurance Plan Physician Services Claims database (OHIP), NACRS - National Ambulatory Care Reporting System, the Ontario Diabetes Database (ODD), HYPERTENSION, Ontario Congestive Heart Failure database (CHF), Ontario Chronic Obstructive Pulmonary Disease database, Ontario Mental Health Reporting System (OMHRS) stand-alone admissions dataset, Ontario Cancer Registry Data (OCD), Ontario Registrar General Death (ORGD) data.

AMI – acute myocardial infarction, CABG - coronary artery bypass graft surgery; CHF – chronic heart failure; COPD – chronic obstructive pulmonary disease, ED – emergency department.

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