

Supplementary material

Table 1 - Study Characteristics

Ref	Year	Author	Country	Study design	Population	Follow up (years)	Exposure to outcome (years)	Cohort size	Mean age at enrolment	PD cases	F	M	Mean Age	Control	F	M	Mean Age	Definition of PD	Definition of Constipation	Exposure Assessment	CC Matching	Factors Adjusted For
16	1997	Gonera	NL	CC	63 general practices	10	NK	NA	NA	60	29	31	54.9	58	29	29	54.3	Neurologist diagnosed, Queen Square Brain Bank Criteria	ICPC defined	General Practice record review	Age, sex	-
15	2001	Abbott	USA	Cohort	Honolulu Heart Program	24	12	6790	60	96	-	96	73	6694	-	6694	NK	Hospital Records / Death certificates / Neurologist diagnosed	<1 BM per day (≤3 per week) compared to daily	Structured questionnaire	NA	1. Age; 2. Age, smoking, coffee, laxatives, jogging, fruit, vegetables, grains
17	2009	Savica	USA	CC	Rochester Epidemiology Project, Olmsted County, Minnesota	38	>20	NA	NA	196	75	121	71	196	75	121	71	Medical record review (2/4 cardinal features exc other causes). Validated.	Diagnosis of constipation or use of laxatives	Medical record review	Age, sex	1. Unadjusted primary model; 2. Adjusted for smoking, coffee; 3. multiple secondary analyses
6	2011	Gao	USA	Cohort	Health Professionals Follow up Study	6	NK	33 901	66.9	156	-	156	NK	33 745	-	33 745	NK	Neurologist diagnosed or 2/3 of cardinal features exc other causes	BM every 3 days or less (<3 per week) compared to daily	Structured questionnaire	NA	1. Age, smoking, BMI, NSAIDs, laxatives, alcohol, caffeine, lactose; 2. as above, with the exclusion of regular laxative users
6	2011	Gao	USA	Cohort	Nurses' Health Study	24	NK	93 767	48.4	37	37	-	NK	93 730	93 730	-	NK	Neurologist diagnosed or 2/3 of cardinal features exc other causes	BM every 3 days or less (<3 per week) compared to daily	Structured questionnaire	NA	1. Age, smoking, BMI, NSAIDs, laxatives, alcohol, caffeine, lactose; 2. as above, with the exclusion of regular laxative users
7	2014	Plouvier	NL	CC	CMR database; University of Nijmegen	2	NK	12000	NA	86	37	49	72.3	78	36	42	70.6	GP or neurologist diagnosed - coded within CMR database	Diagnosis in the CMR database	CMR record review	Age, sex, SES, primary care practice	-
8	2014	Lin	Taiwan	Cohort	National Health Insurance Database	5.5	NK	551324	43.5	2336	1170	1166	69.32	548988	289481	259507	43.38	Hospital discharge diagnosis or Neurologist diagnosed	Diagnosis in database and use of laxatives	Database review	NA	Age, sex, co-morbidities, medication use, hospital attendances
9	2014	Schrag	UK	CC	Health Improvement Network UK Primary care database	14	> 10	NA	NA	8166	3307	4859	75	46755	19071	27684	74	Read code in database and ≥ 2 PD medications	Read code in database or laxative prescription	Database review	Sex, age, registration period	-
10	2014	Pont-Sunyer	Spain, Austria	CC	11 outpatient clinics	>10	>10	NA	NA	109	40	69	66.6	107	48	59	65.7	Queen Square Brain Bank Criteria	3 months of < 3 BMs per week or straining	NMS questionnaire	Age, gender	-

Abbreviations: BM = bowel movement; PD = Parkinson's Disease; NK = not known; NA = not applicable; SES = socioeconomic status; NMS = non motor symptom; CMR = continuous morbidity registration; ICPC = International classification of primary care; NL = Netherlands; CC = case control; F = female; M = male

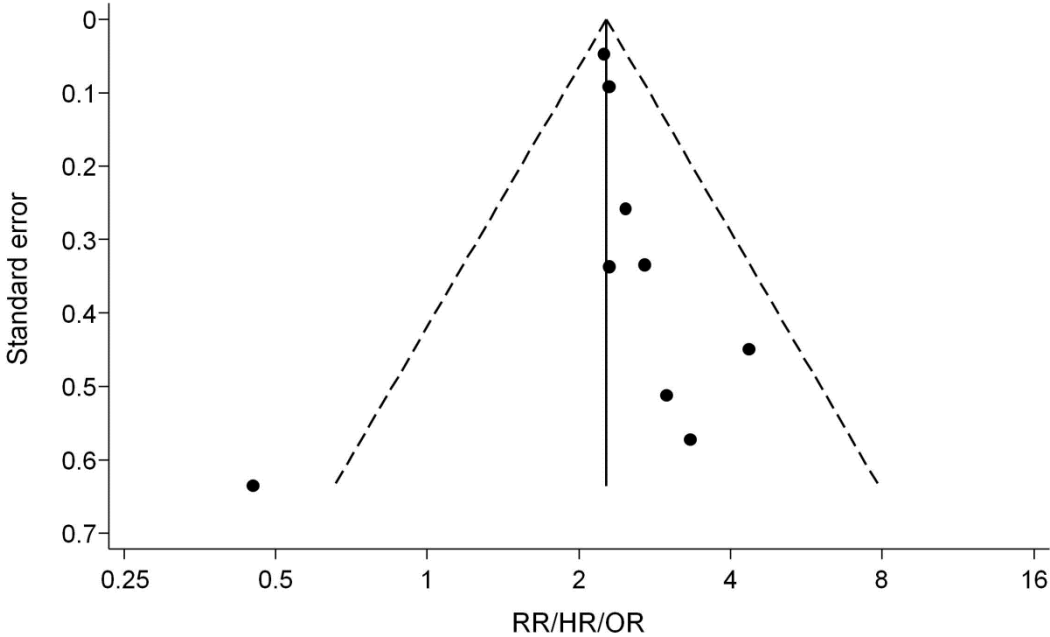
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Table 2 - Newcastle Ottawa Scale (NOS) scoring of case-control and cohort studies

Ref	Author	Selection				Comparability		Exposure / Outcome			NOS Score
		1	2	3	4	1a	1b	1	2	3	
Case-control											
16	Gonera	1	0	1	1	1	1	0	1	1	7/9
17	Savica	1	1	1	1	1	1	0	1	1	8/9
7	Plouvier	0	1	1	1	1	1	0	1	1	7/9
9	Schrag	1	1	1	1	1	1	0	1	1	8/9
10	Pont-Sunyer	1	1	1	1	1	1	0	1	1	8/9
Cohort											
15	Abbott	0	1	1	1	1	1	1	1	1	8/9
6	Gao (HPFS)	0	1	1	1	1	1	1	0	0	6/9
6	Gao (NHS)	0	1	1	1	1	1	1	1	0	7/9
8	Lin	1	1	0	1	1	1	1	0	1	7/9

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Figure 4 - Funnel plot



Abbreviations: RR = relative risk; HR = hazard ratio; OR = odds ratio