

SUPPLEMENTAL MATERIALS

Anti-basal ganglia antibodies in primary obsessive-compulsive disorder: systematic review and meta-analysis

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Table DS1 Electronic database systematic search strategy

Table DS2 Criteria for assessing risk of bias in included studies

Table DS3 Characteristics of excluded studies

Fig. DS1. Funnel plot

Additional references Excluded studies

Table DS1 Electronic database systematic search strategy

#	Search terms	Results
1	basal ganglia.tw.	23049
2	(caudate or caudate nucleus).tw.	21051
3	(striatum or ventral striatum or striatal or corpus striatum).tw.	60924
4	putamen.tw.	13027
5	claustrum.tw.	999
6	globus pallidus.tw.	7334
7	neostriatum.tw.	3137
8	nucleus accumbens.tw.	15383
9	(Substantia Innominata or substantia nigra or Basal Nucleus of Meynert).tw.	20814
10	(neuronal specific enolase or gamma enolase or non-neuronal specific enolase or enolase or pyruvate kinase or pyruvate kinase M1 or aldolase or aldolase C or lysoganglioside or GM1 or tubulin or D1 or D2 or dopamine receptor or N-acetyl-beta-d-glucosamine or GlcNAc or CaM kinase II or 40 kDa or 45 kDa or 60 kDa).tw.	142833
11	exp neuron specific enolase/	5702
12	exp ganglioside GM1/	4047
13	exp tubulin/	13525
14	exp dopamine 1 receptor/	9043
15	exp dopamine 2 receptor/	16543
16	exp n acetylglucosamine/	5998
17	exp pyruvate kinase/	7447
18	GABHS.mp.	445
19	exp streptococcal infections/	44639
20	exp streptococcus/	98657
21	"basal ganglion".tw.	377
22	"basal nucl*".tw.	1181
23	exp Basal Ganglia/	106414
24	("anti neuronal" or "antineuronal" or "antibrain" or "anti brain").tw.	1111
25	("antibasal ganglia" or "anti basal ganglia" or "abga").tw.	89
26	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25	416615
27	exp immunoglobulins/	347618
28	antibody formation.mp. or exp antibody formation/	67063
29	(immunoglobul* or Ig* or IgG or IgM or IgA or "immune complex*" or antibod* or autoanti* or antigen*).tw.	1439306
30	ELISA.mp. or exp Enzyme-Linked Immunosorbent Assay/	223875
31	immunohistochemistry.mp. or exp Immunohistochemistry/	381348
32	exp Fluorescent Antibody Technique/ or immunofluorescence.mp.	35391
33	western blotting.mp. or exp Blotting, Western/	170029
34	"western blot*".tw.	163537
35	27or28or29or30or31or32or33or34	2062047
36	26 and 35	66478
37	("obsessive compulsive" or ocd).tw.	15202
38	leyton obsess*.tw.	104
39	"schedule of compulsions".tw.	2
40	"obsessional compulsive".tw.	156
41	"hamburg obsess*".tw.	15
42	("yale brown obsessive compulsive scale" or "YBOCS" or "Y BOCS").tw.	1551
43	exp Yale Brown Obsessive Compulsive Scale/	473
44	exp obsessive compulsive disorder/	25453
45	37 or 38 or 39 or 40 or 41 or 42 or 43 or 44	28440
46	36 and 45	202

Table DS2 Criteria used to assess of risk of bias in included studies

Definition of cases

Low Clearly states that participants in the OCD study arm could not have any post-streptococcal neuropsychiatric disorder (e.g., Tourette syndrome, PANS, Sydenham chorea); AND
OCD diagnosis was made by an appropriate clinical rater at the time of study enrolment using DSM criteria

Unclear Met either one of the above two criteria, but not both.

High Not specified, OR

Otherwise unclear

Representativeness of cases

Low Randomly recruited; OR

Consecutively recruited; OR

Were otherwise clearly a representative sample of cases

Unclear Not specified, OR

Otherwise unclear

High Convenience sample, OR

Clearly a non-random sample of cases

Definition of controls

Low Clearly stated that controls could not have obsessive-compulsive disorder; AND

Clearly stated that controls could not have any post-streptococcal neuropsychiatric disorder

Unclear Met one of the two above criteria, but not both.

High Not specified, OR

Otherwise unclear

Age-matched controls

Low Yes (explicitly stated)

Unclear Not specified, OR

Not explicitly/unclearly stated.

High Clearly stated, no.

Sex-matched controls

Low Yes (explicitly stated)

Unclear Not specified, OR

Not explicitly/unclearly stated.

High Clearly stated, no.

Blinded outcome assessment

Low Yes (explicitly stated)

Unclear Not specified, OR

Not explicitly/unclearly stated.

High Clearly stated, no.

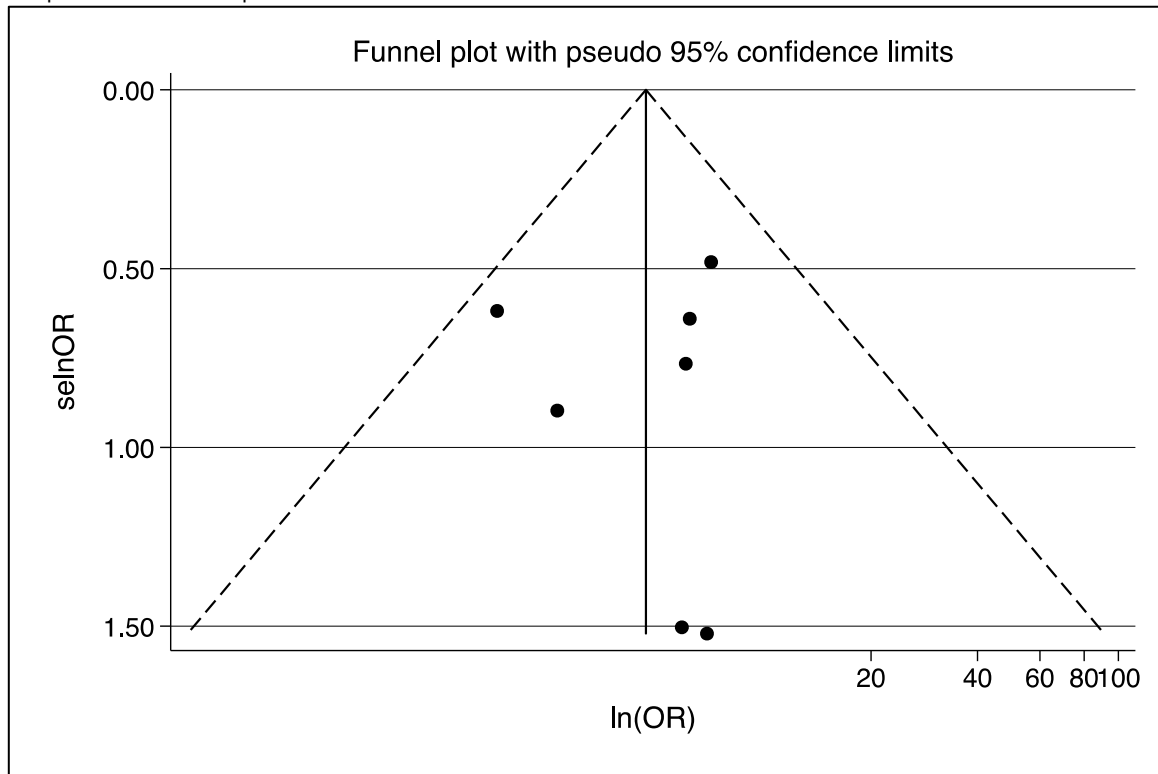
Abbreviations: OCD, obsessive-compulsive disorder; PANS, pediatric acute-onset neuropsychiatric disorders; DSM, diagnostic and statistical manual of mental disorders.

Table DS3 Studies excluded after full-texts were assessed for eligibility

Study	Reference	Reason for exclusion
Besiroglu 2007	(1)	Wrong design: case series
Black 1998	(2)	Wrong design: case series
Bombaci 2009	(3)	Wrong participants: assessed participants with tics, not with OCD
Cardona 2001	(4)	Wrong participants: assessed participants with tics, not with OCD
Dua 2012	(5)	Wrong exposure: assessed antibody effects in mice
Eisen 2001	(6)	Wrong exposure: D8/17 positivity
Gorker 2011	(7)	Wrong exposure: anti-brain antibodies not otherwise specified
Harel 2001	(8)	Wrong participants: anorexia nervosa
Hoekstra 2003	(9)	Wrong exposure: neuroblastoma cells
Islam 2012	(10)	Wrong design: case report
Kansy 2006	(11)	Wrong participants: Tourette syndrome
Kawikova 2010	(12)	Insufficient data: combined results for OCD and Tourette syndrome/PANS
Kiessler 1994	(13)	Wrong participants: obsessive-compulsive symptoms; no OCD diagnosis
Loiselle 2003	(14)	Wrong participants: Tourette syndrome
Martino 2011	(15)	Wrong participants: Tourette syndrome
Martino 2007	(16)	Wrong participants: Tourette syndrome
Matsuo 2004	(17)	Wrong design: case series
Miman 2010	(18)	Wrong exposure: toxoplasma serology
Muller 2001	(19)	Wrong participants: Tourette syndrome
Murphy 2009	(20)	Insufficient data (meeting abstract)
Murphy 1997	(21)	Wrong exposure: D8/17 positivity
Murphy 2004	(22)	Wrong design: case series
Murphy 2012	(23)	Wrong design: no control group (compared participants with tics and/or OCD)
Murphy 2011	(24)	Wrong design: case series
Nicholson 2007	(25)	Wrong design: letter to the editor
Pavone 2004	(26)	Wrong participants: PANS
Peterson 2000	(27)	Wrong exposure: streptococcal titers and basal ganglia volume
Rizzo 2006	(28)	Wrong participants: Tourette syndrome
Sanchez-Carpintero 2009	(29)	Wrong participants: ADHD
Shirazi 2012	(30)	Wrong exposure: streptococcal antibody titers
Singer 2009	(31)	Insufficient data: assessed anti-lysoganglioside/tubulin (meeting abstract)
Singer 1998	(32)	Wrong participants: Tourette syndrome
Singer 1999	(33)	Wrong participants: Tourette syndrome
Singer 2005	(34)	Wrong participants: Tourette syndrome
Singer 2004	(35)	Wrong participants: cases PANS
Singer 2012	(36)	Wrong design: case series
Sokol 2000	(37)	Wrong participants: anorexia nervosa
Swedo 1991	(38)	Insufficient data: (meeting abstract)
Zuccolo 2012	(39)	Wrong participants: PANS
Zuccolo 2012a	(40)	Insufficient data (meeting abstract)

Abbreviations: ADHD, attention-deficit hyperactivity disorder; OCD, obsessive-compulsive disorder; PANS, pediatric acute-onset neuropsychiatric syndrome.

Fig. DS1 Funnel plot assessing potential publication bias for ABGA seropositivity in primary obsessive-compulsive disorder compared with controls.^a



Abbreviations: log, natural logarithm; OR, odds ratio; se, standard error.

^aDots represent included studies; the y-axis reflects the number of participants in each study as the standard error of the log transformed odds ratio; the x-axis reflects the effect size of the point estimate log transformed odds ratio for ABGA seropositivity in primary obsessive-compulsive disorder versus controls in each study; the vertical line represents the average log transformed effect size.

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