

Table S1. Summary of included studies

Study	Country	Study design	Data source	Inclusion periods Inclusion/exclusion criteria	Participants number	ASD diagnostic criteria	AD diagnostic criteria	Study results	Quality scores ^a
Population-based studies Liao et al. (1), 2016	Taiwan	Nationwide cohort study	Taiwan's NHIR Database	2000–2004. (Follow to 2010.12) Children <2 years. Died during the follow-up period were excluded.	387262 AD vs 387262 control	At least 2 outpatient visits with ASD (ICD-9-CM code 299).	ICD-9-CM code 691	AD-exposed children received a diagnosis of ASD higher than nonexposed peers.	8
Lee et al. (2), 2016	Taiwan	Nationwide cohort study	Taiwan's NHIR Database	(Follow to 2011) Children aged from 1 month to 3 years.	18473 AD vs 18473 control	At least twice ASD diagnosis (ICD-9-CM code: 299) by psychiatrist.	At least twice AD diagnosis (ICD-9-CM: 691 or 691.8) by dermatologist/pediatrician/rheumatologist.	AD-exposed children received a diagnosis of ASD higher than nonexposed peers.	8
Chen et al. (3), 2013	Taiwan	Nationwide case-control study	Taiwan's NHIR Database	1996–2010	1598 ASD vs 6392 control	ICD-9-CM code: 299 by psychiatrists.	ICD-9-CM codes: 691 or 691.8) by dermatologists/Pediatricians	Patients with ASDs had higher prevalence of AD	8
Lin et al. (4), 2014	Taiwan	Nationwide case-control study	Taiwan's NHIR Database	Children aged < 18 years	578 ASD vs 25688 control	At least twice ASD diagnosis (ICD-9-CM code: 299) by psychiatrists.	At least twice AD (ICD-9-CM codes: 691 or 691.8) by doctors	Patients with ASDs had higher prevalence of AD	8
Zerbo et al. (5), 2015	USA	Population case-control study	KPNC members	1995–2006 Children aged 3 to 18 years	5565 ASD vs 27825 control	At least 2 ASD diagnoses (ICD-9-CM codes 299.0 or 299.8)	At least 2 AD diagnoses (ICD-9-CM codes)	Patients with ASDs had higher prevalence of AD	8
Alexeief et al. (6), 2017	USA	Population case-control study	KPNC members	2000–2009 (Follow to 2012.06)	3911 ASD vs 38609 control	An ASD diagnosis from an ASD specialist or two or more ASD diagnoses from non-specialists	ICD-9 codes	Patients with ASDs had higher prevalence of AD	7
Schieve et al. (7), 2012	USA	National survey Interview Surveys	National Health Interview Surveys	2006–2010 Children aged 3 to 17 years	375 ASD vs 35775 Control	Questionnaire via in-person interviews	Questionnaire via in-person interviews (past 12 months at time of survey) of eczema/skin allergy	Patients with ASDs had higher prevalence of eczema/skin allergy	5
Shibata et al. (8), 2013	Japan	Population Survey	Kindergartens and nursery schools in Kanazawa city	2009.09–11 Children aged 3 to 5 years	1220 ASD vs 187 Control	Self-administered questionnaires Autism Screening Questionnaire (score >= 8)	Self-administered questionnaires (According diagnosis of a medical doctor)	Patients with ASDs had similar prevalence of eczema with control group	5
Yaghimae et al. (9), 2013	USA	National survey NSCH	NSCH	2007	10408 AD vs 69180 control	Telephone survey question	Telephone survey question (past 12 months eczema or skin allergy)	Prevalence of ASDs was increased in children with AD	6
Garg et al. (10), 2014	USA	National survey NSCH	NSCH	2007–2008 Children aged 0 to 5 years	220 ASD vs 16390 control	Telephone survey question	Telephone survey question	Patients with ASDs had similar prevalence of eczema with control group	6
Institution-based studies Molloy et al. (11), 2006	USA	Case-control study	The Kelly O'Leary Center for ASD	Children aged 3–11 years. Any known chromosomal or neurological disorders, or parents received steroids, secretin or IVIg within 6 months were excluded.	20 ASD vs 20 control	DSM-IV criteria and confirmed with the ADOS- Western Psychological Services Edition	Questionnaire via in-person interviews (eczema or AD)	Patients with ASDs had similar prevalence of AD with control group	8
Mostafa et al. (12), 2008a	Egypt	Case-control study	Psychiatric and Pediatric Clinics	2006.08– 2007.07	50 ASD vs 50 control	DSM-IV	Standardized diagnostic criteria	Patients with ASDs had higher prevalence of AD	9
Mostafa et al. (13), 2008b	Egypt	Case-control study	Psychiatric and Pediatric Clinics	2007.09– 2008.02	40 ASD vs 40 control	DSM-IV	Standardized diagnostic criteria	Patients with ASDs had higher prevalence of AD	9
Jyonouchi et al. (14), 2008	USA	Case-control study	Pediatric Allergy/ Immunology Clinic	2005.04–2008.05	26 ASD vs 26 control	DSM-IV and/or ADOS by developmental pediatricians/ pediatric neurologists/ psychiatrists.	Positive skin prick test reactivity and/ or presence of allergen-specific IgE accompanied by clinical features consistent with AD.	Patients with ASDs had similar prevalence of AD with control group	6
Maqalhães et al. (15), 2009	Brazil	Case-control study	Neurology Clinic	2006.01– 2008.12 Male patients. Patients had epilepsy/ morphological alterations or using oral steroids (antihistamines or any disease interfere with immunological status were excluded	15 ASD vs 15 control	DSM-IV-TR and Filippek's review criteria	Clinical history in relation to AD symptoms with positive skin test reactivity to allergen	Patients with ASDs had similar prevalence of AD with control group	8
Mostafa et al. (16), 2010	Egypt	Case-control study	Pediatric Neuropsychiatric Clinic	2008.07–2008.12 Patients with neurological/ metabolic disorders were excluded.	30 ASD vs 30 control	DSM IV	Standardized diagnostic criteria	Patients with ASDs had similar prevalence of AD with control group	8
Mostafa et al. (17), 2013	Egypt	Case-control study	Pediatric Neuropsychiatric Clinic	Patients with neurological/metabolic disorders were excluded.	42 ASD vs 42 control	DSM IV	Standardized diagnostic criteria	Patients with ASDs had similar prevalence of AD with control group	8

^aThe methodologic quality of the studies was rated using an adapted version of the Newcastle–Ottawa Scale (NOS) for case-control studies or cohort studies with a maximum score of 9 points. AD: atopic dermatitis; ADOS: Autism Diagnostic Observation Schedule; DSM-IV-TR: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision; KPNC ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; Kaiser Permanente Northern California, NHIR: National Health Insurance Research; NSCH: National Survey of Children's Health. References: (1) J Pediatr. 2016;171:248-255 (2) Res Autism Spectr Disord. 2013;7:205-212 (4) Res Autism Spectr Disord. 2014;8:1333-1338 (5) Brain Behav Immun. 2015;46:232-236 (6) J Autism Dev Disord. 2017;47:2067-2079 (7) Res Dev Disabil. 2012;33:467-476 (8) Res Autism Spectr Disord. 2013;7:132-140. (9) J Allergy Clin Immunol. 2013;131:428-433 (10) Ann Allergy Asthma Immunol. 2014;112:525-532 (11) J Neuroimmunol. 2006;172:198-205 (12) J Pediatr Neurol. 2008;6:115-123 (13) J Pediatr Neurol. 2008;6:227-236 (14) J Neuroinflammation. 2009;216:108-112 (16) J Child Neurol. 2010;25:328-335 (17) J Neuroimmunol. 2013;261:77-81.