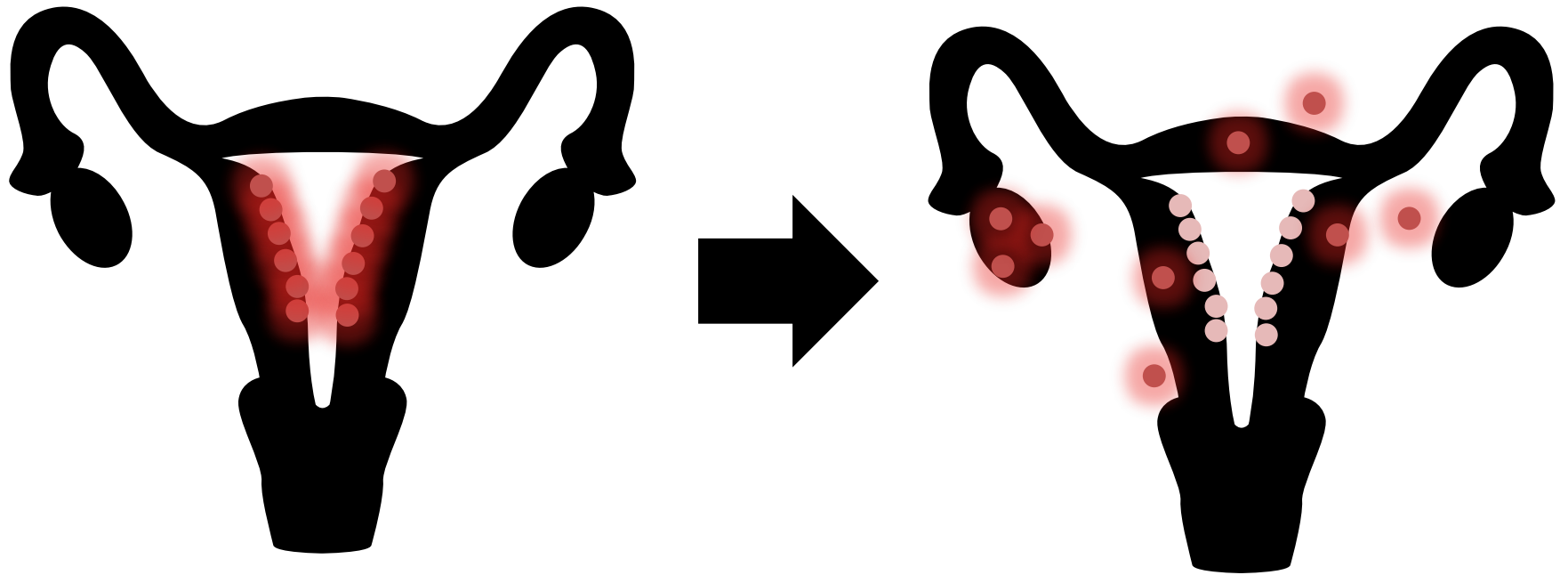


Nickel Allergy Is a Risk Factor for Endometriosis : An 11-Year Population-Based Nested Case-Control Study

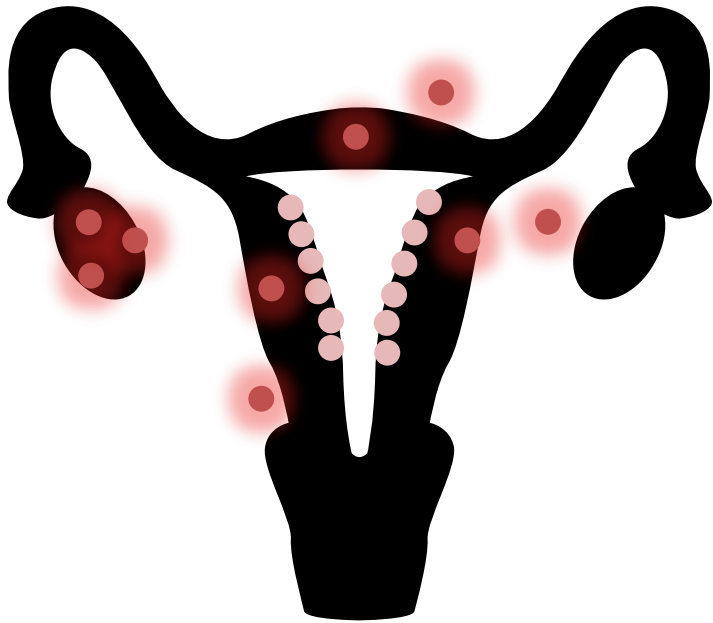
**Jin-Sung Yuk¹, Jong Seung Shin², Ji-Yeon Shin³,
Eunsuk Oh⁴, Hyunmee Kim⁵, Won I. Park⁶**

¹Department of Obstetrics and Gynecology, Gyeongsang National University Changwon Hospital, ²Department of Obstetrics and Gynecology, Hyundai UVIS hospital, ³Preventive medicine, Eulji University, ⁴Internal medicine, Mizmedi hospital, ⁵Family medicine, Mizmedi hospital, ⁶Department of Obstetrics and Gynecology, Hallym University

Endometriosis (EMS)



Incidence



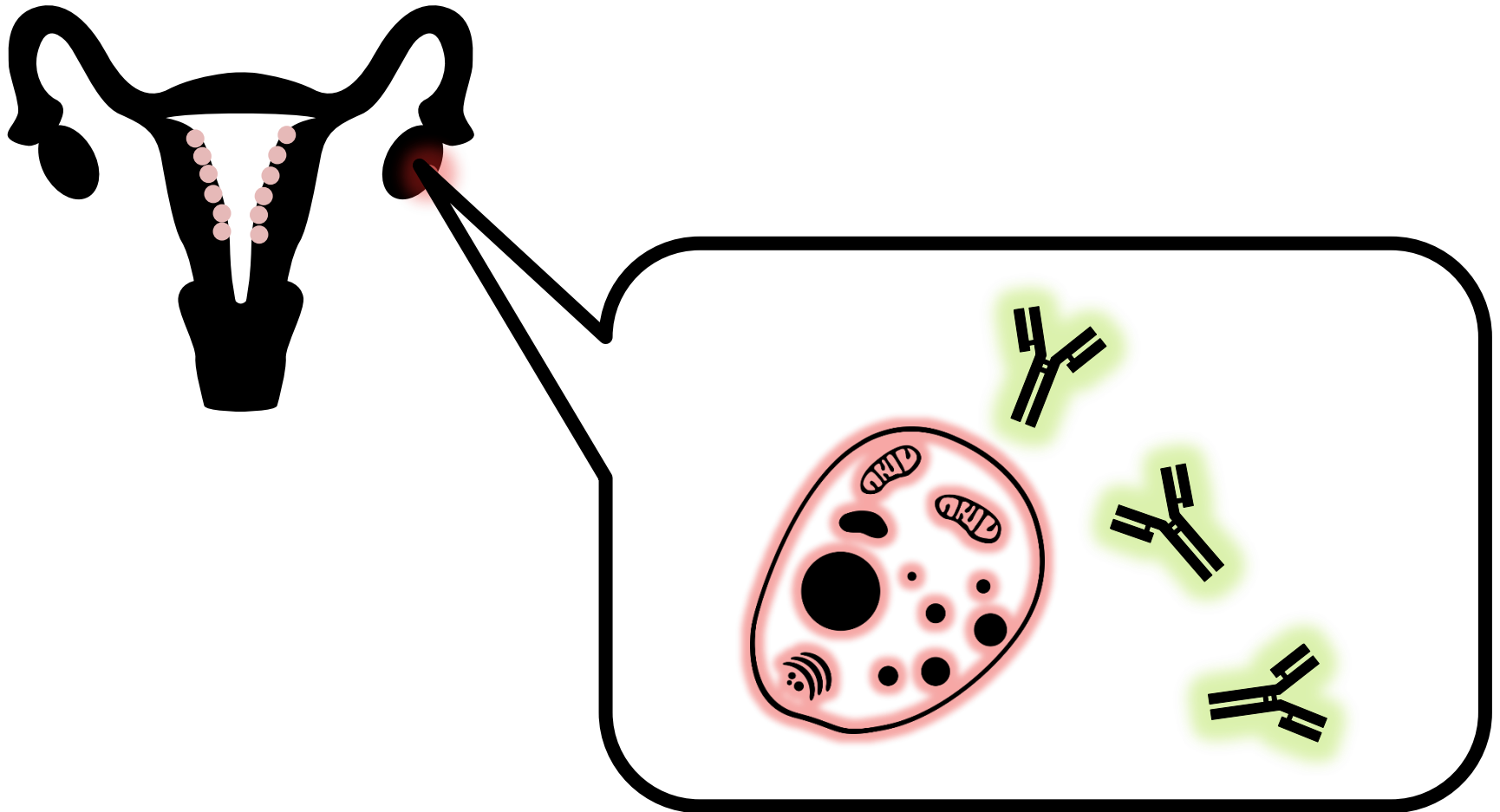
**10% of women
of childbearing age**

Regurgitation

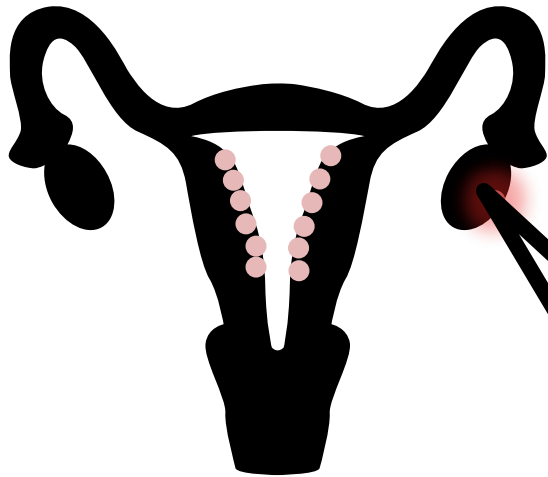


Leading hypothesis

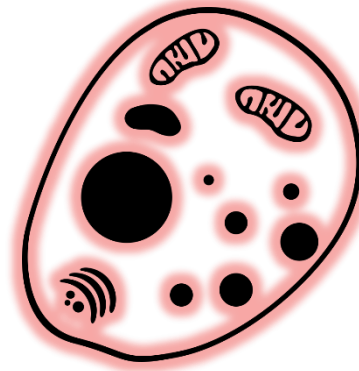
Immune response



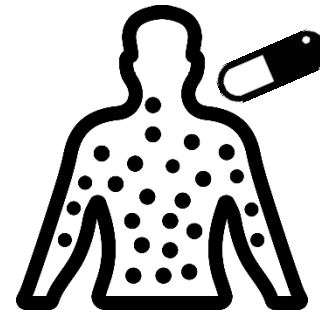
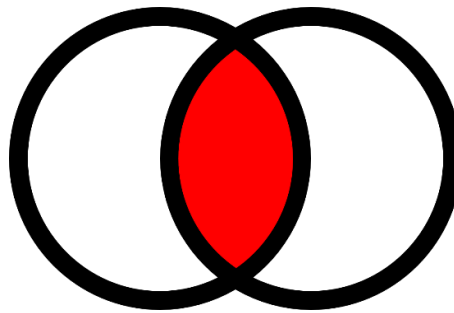
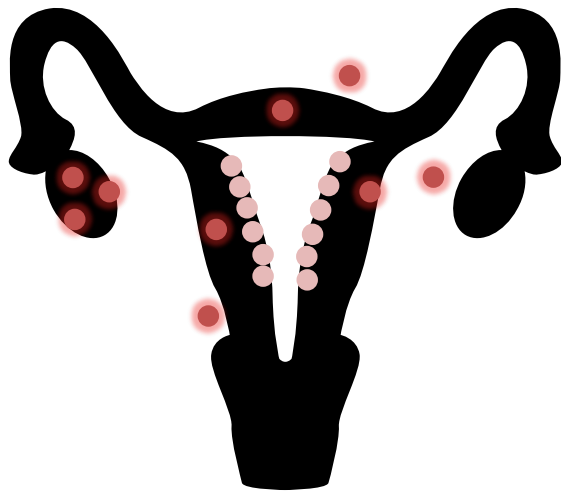
Environmental substances



Dioxin, PCB, phthalate



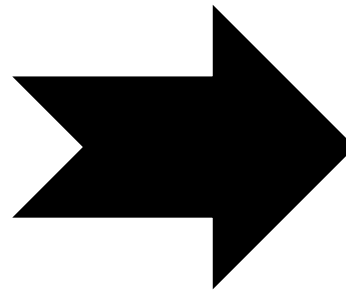
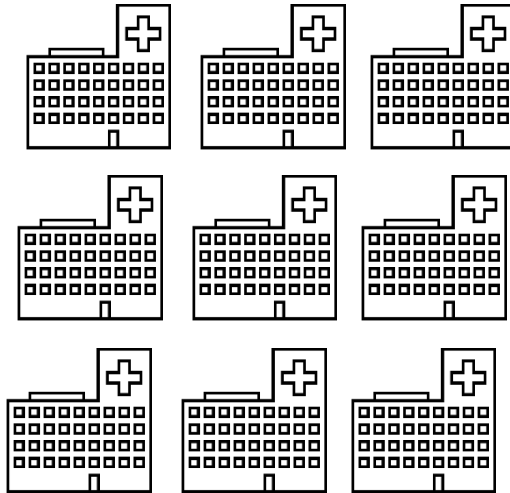
Allergic diseases



HIRA-NIS



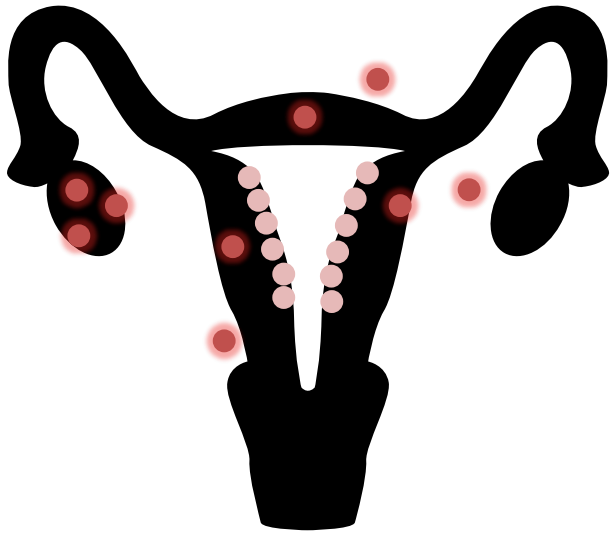
2009-2011



**1,000,000
National
Inpatients
Sample**

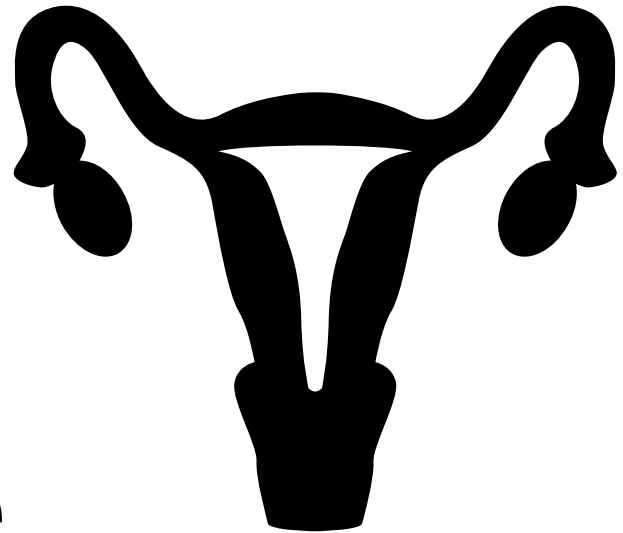


EMS vs Control



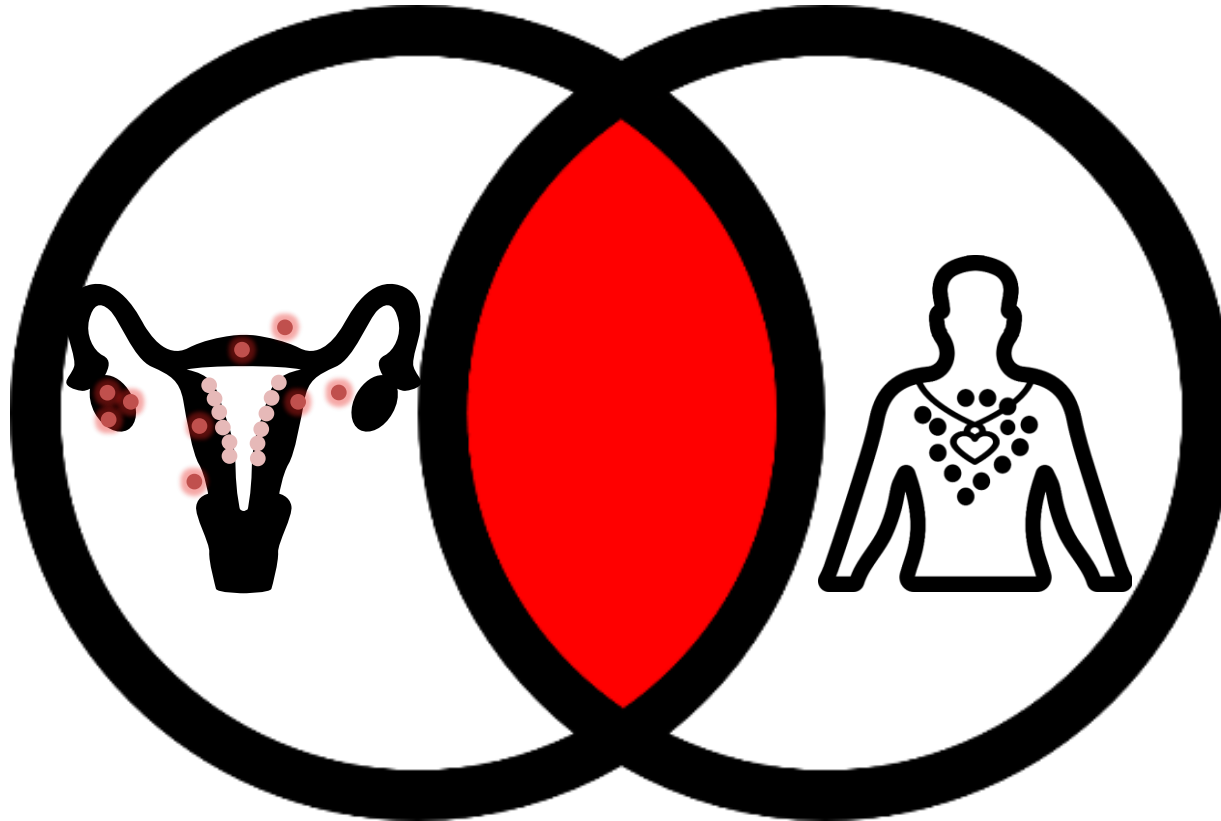
n=7,259

VS



n=535,818

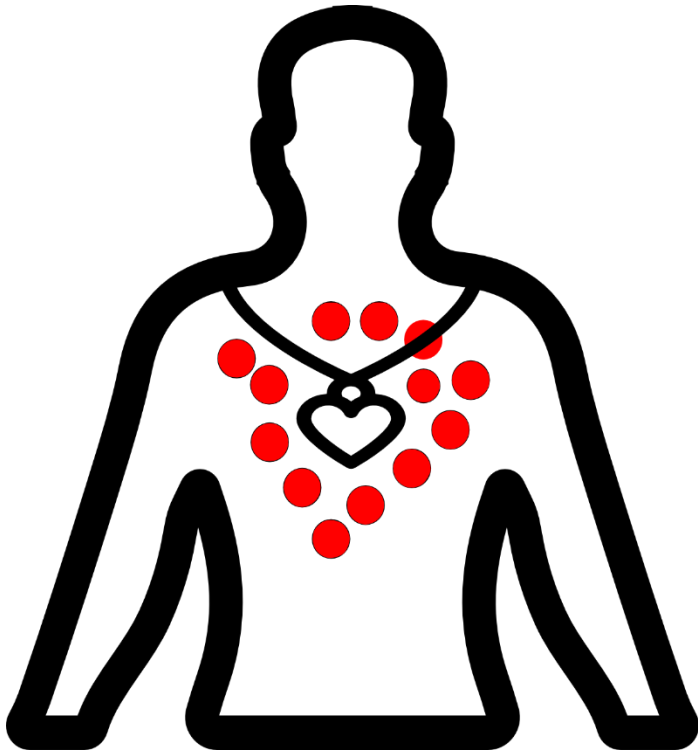
EMS & Nickel allergy



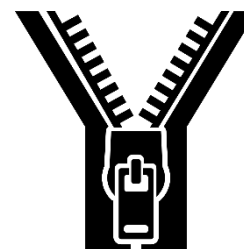
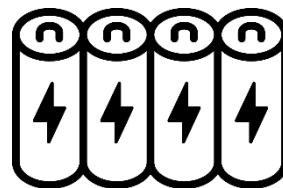
Adjusted OR 1.167 (1.004~1.357)

Nickel allergy

Prevalence 10~23%

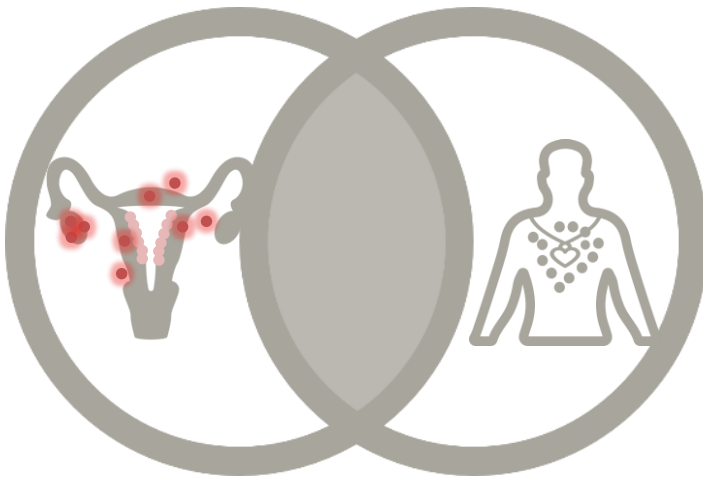


Nickel

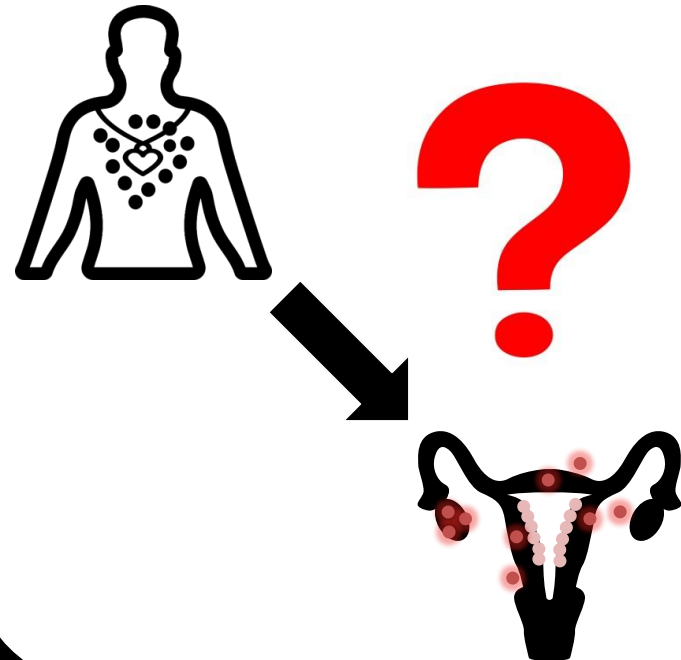


Aim

Relation



Causality

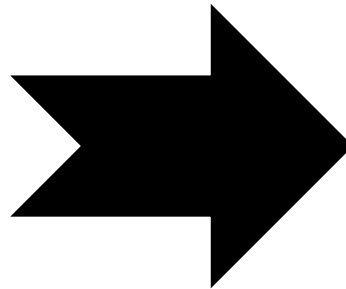


Method

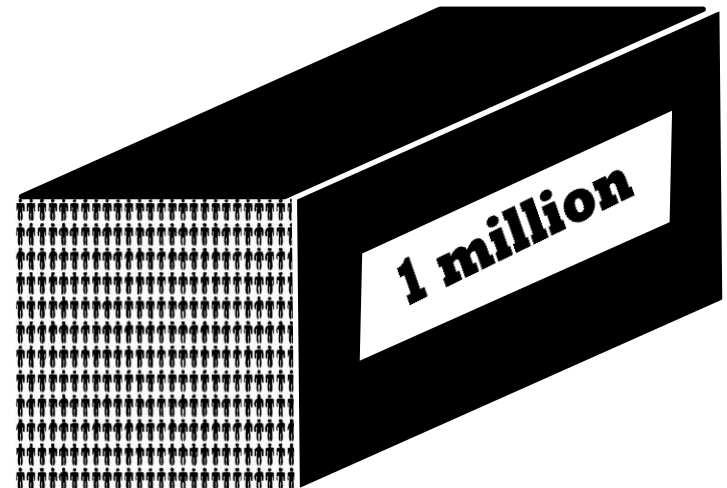
Data



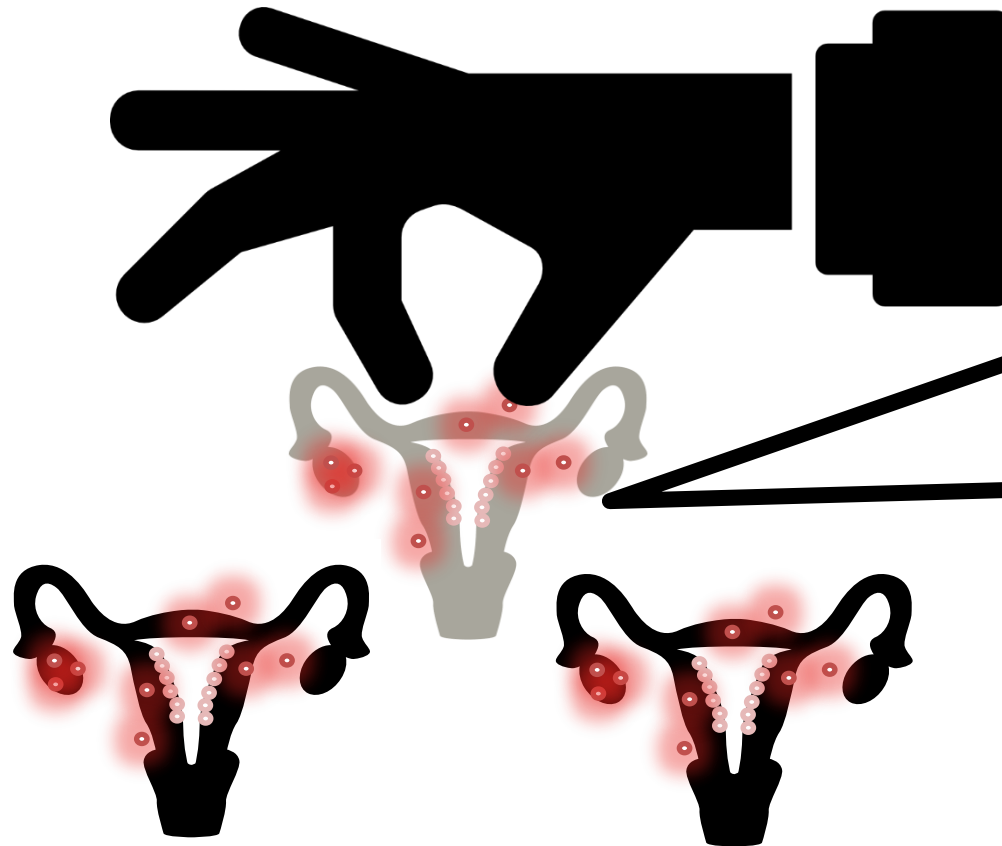
2009~2011
Cross-sectional
data



2002~2013
Cohort data



Exclusion in EMS



2002

2003

2004

2005

2006

2007

2008

2009

2010

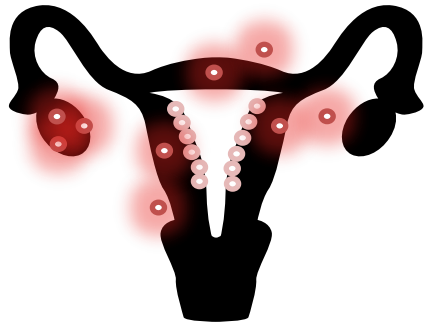
2001

2012

2013

First onset of EMS since 2009

Selection of EMS



6,156 cases

2009

2010

2001

2012

2013

997 cases



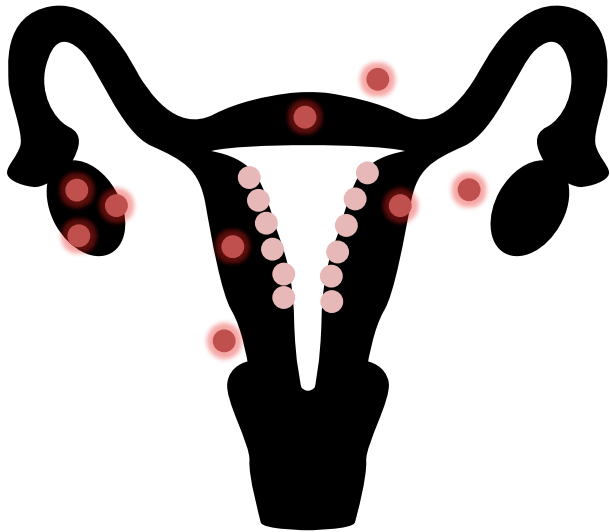
GY op

OR

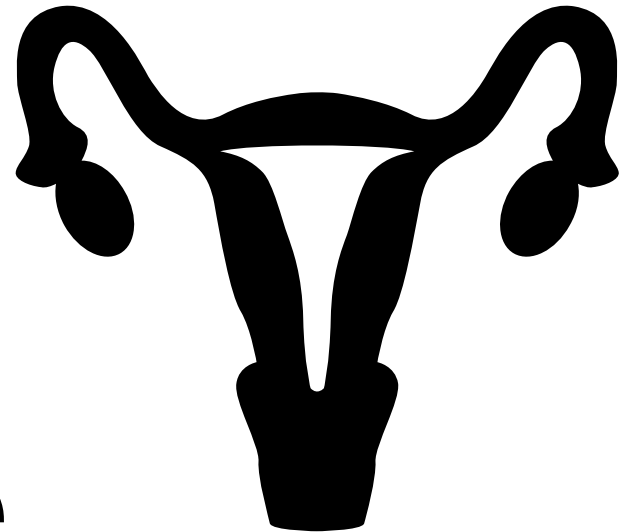


GnRH agonist
or Danazol

EMS vs Control



n=997

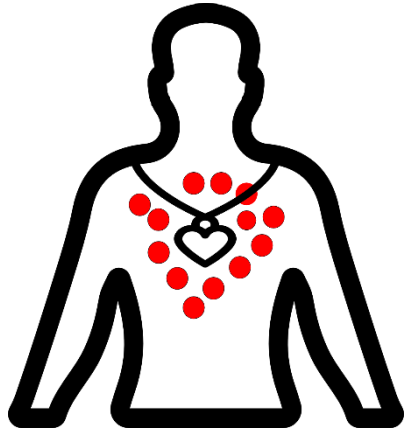


n=3,988

VS

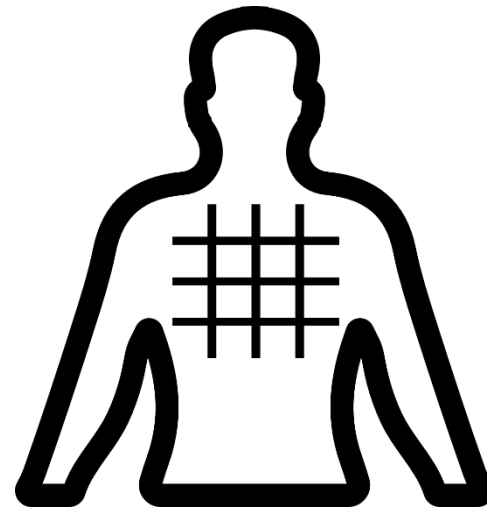
1:4 matching

Selection of Nickel allergy

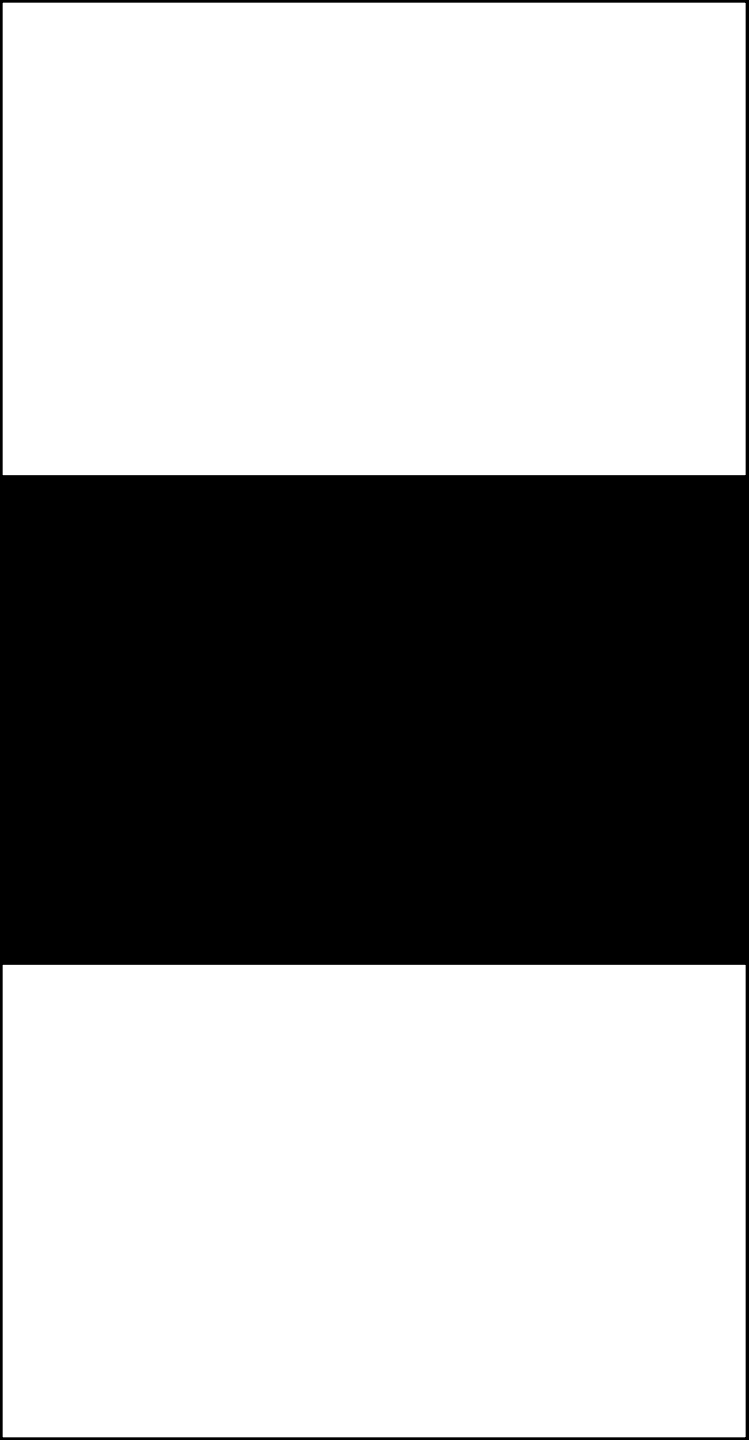


Cases

2002
2003
2004
2005
2006
2007
2008



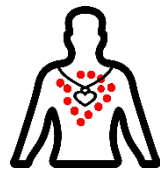
Patch test



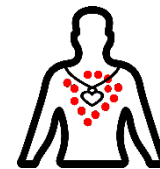
Result

EMS & Nickel allergy

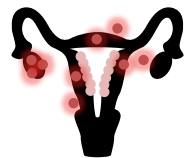
2002
2003
2004
2005
2006
2007
2008
2009
2010
2001
2012
2013



n=8



n=13

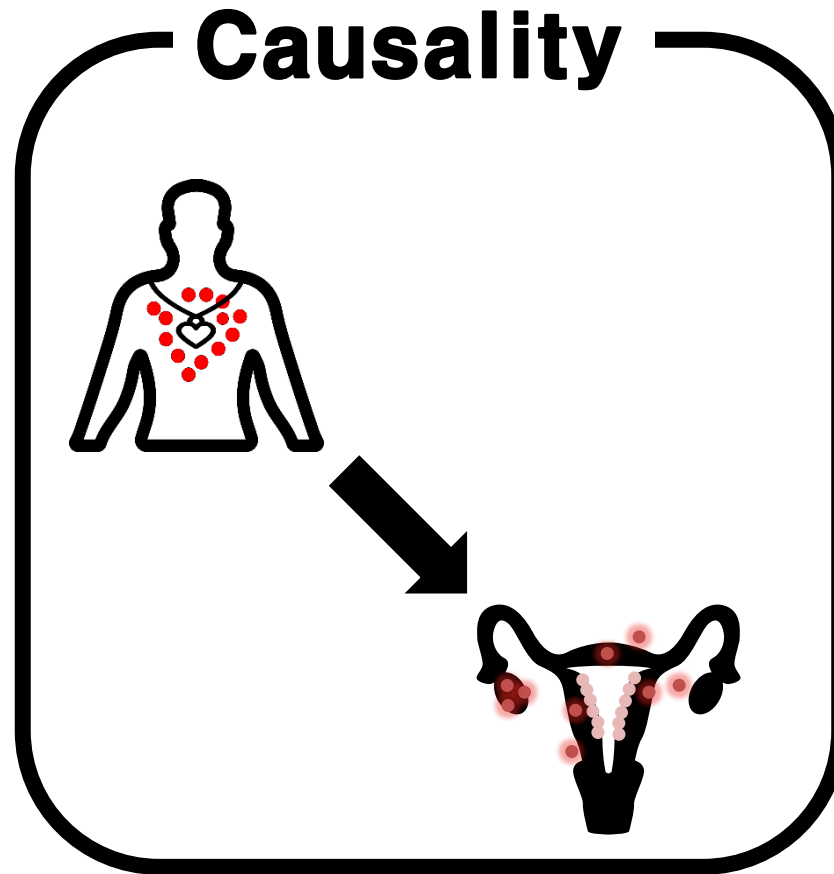


n=997

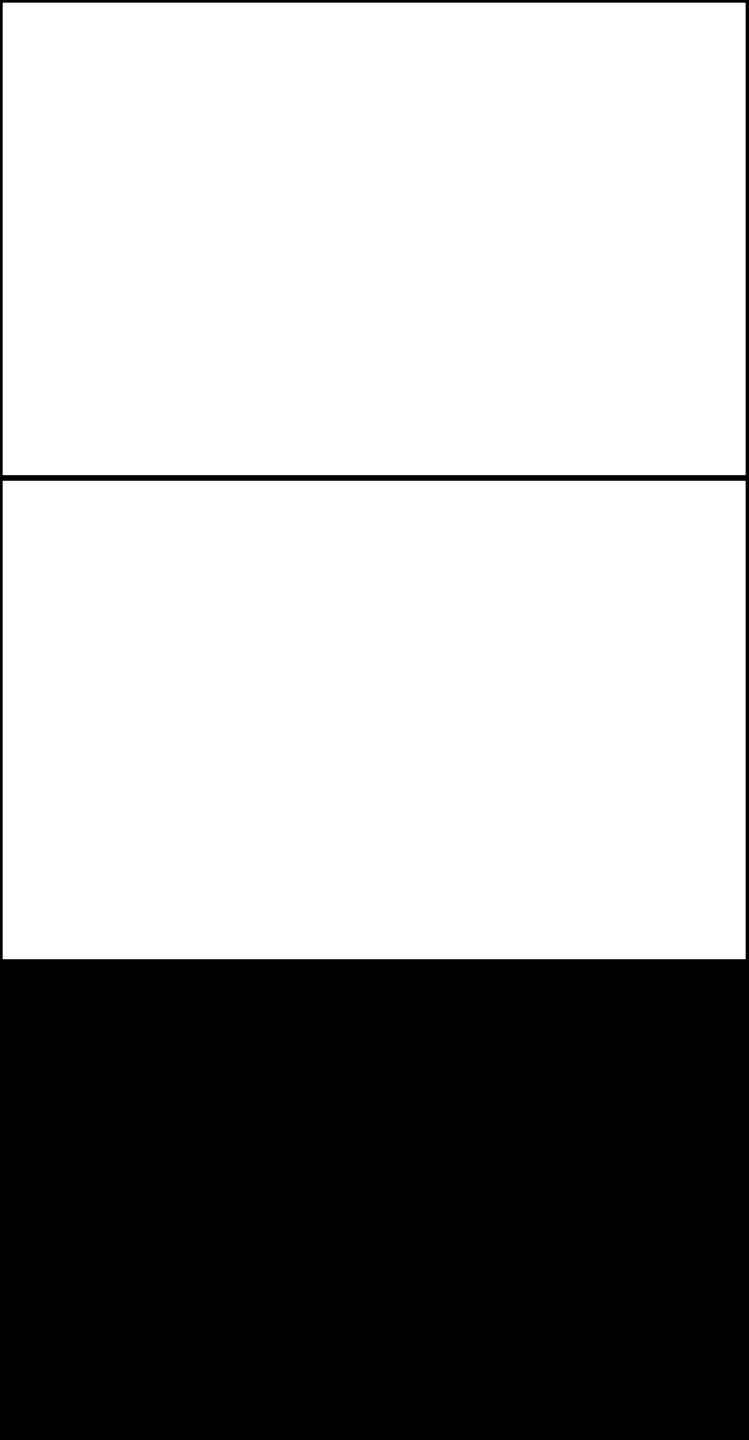


n=3,988

EMS & Nickel allergy

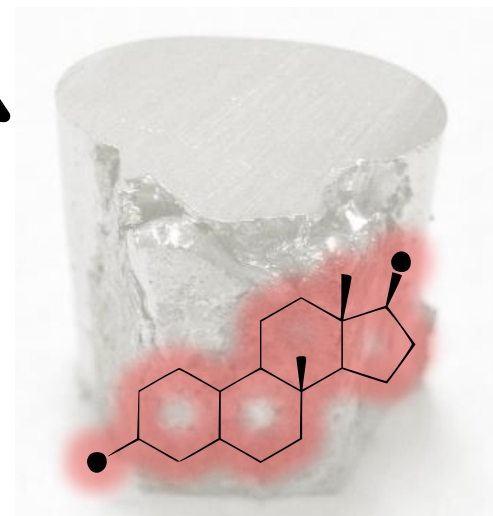
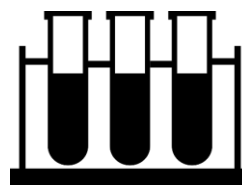
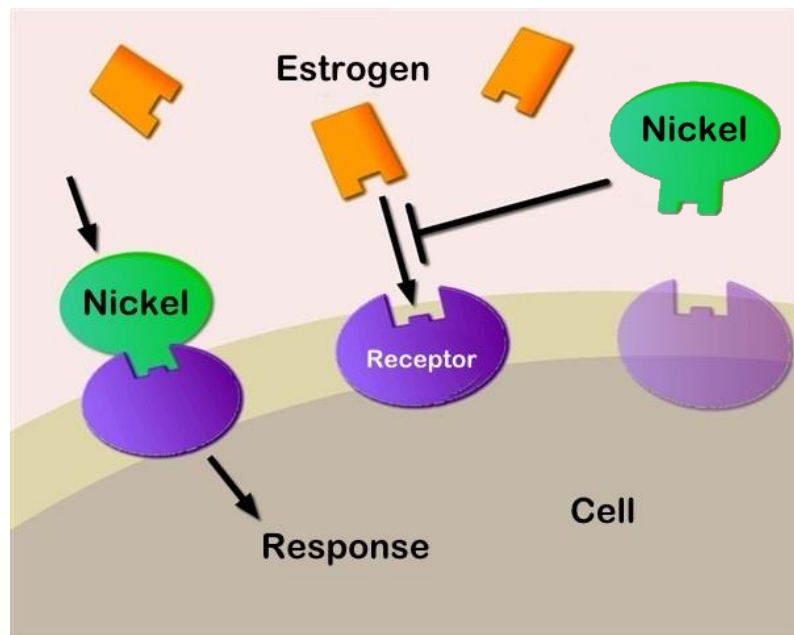


Adjusted OR 2.474 (1.023~5.988)

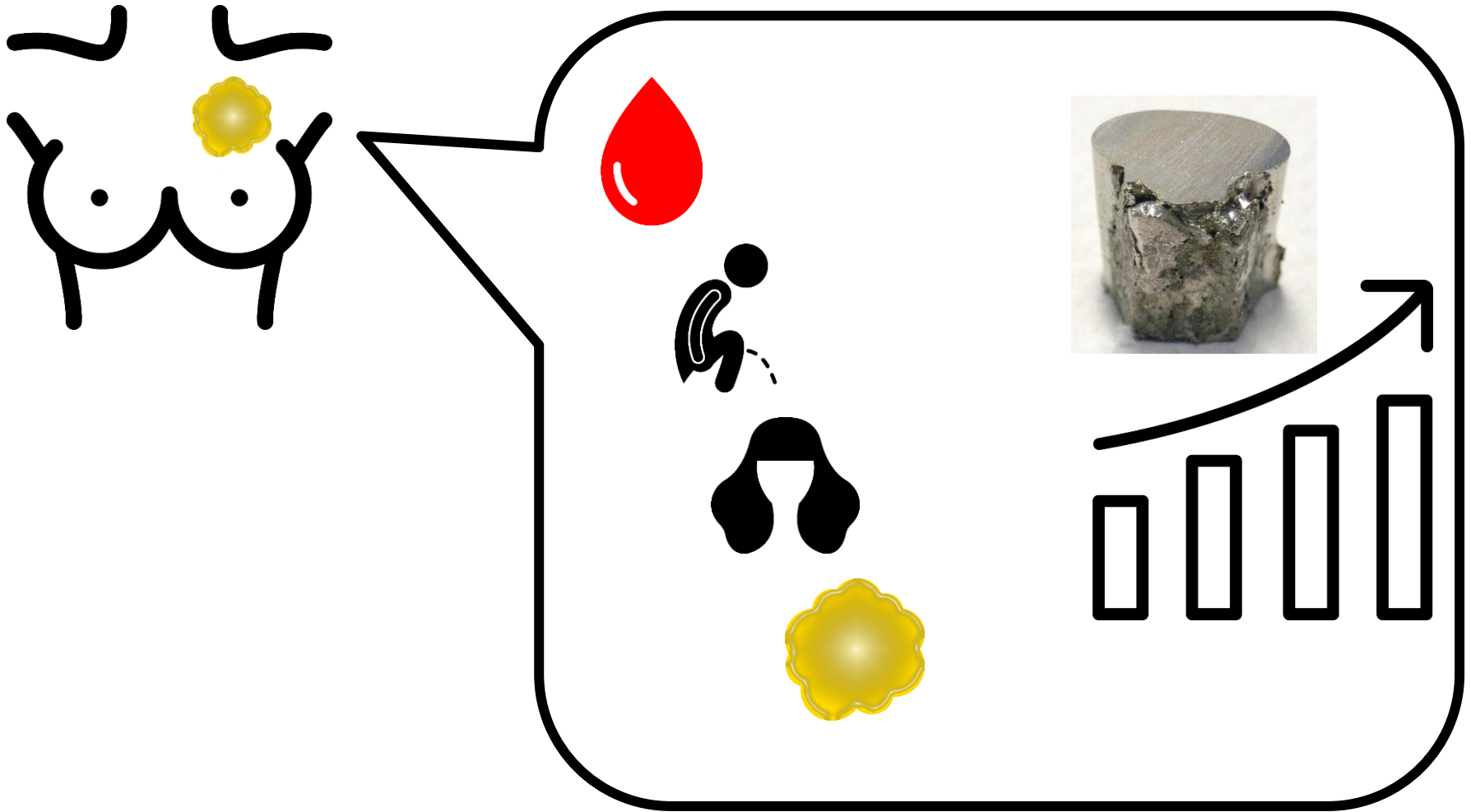


Discussion

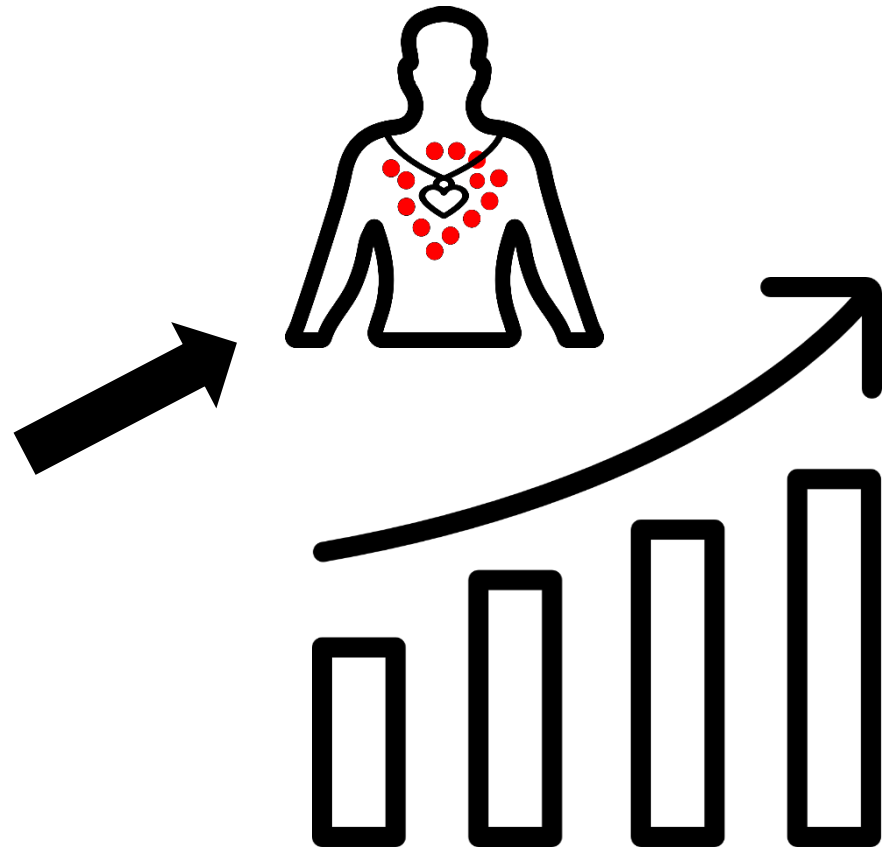
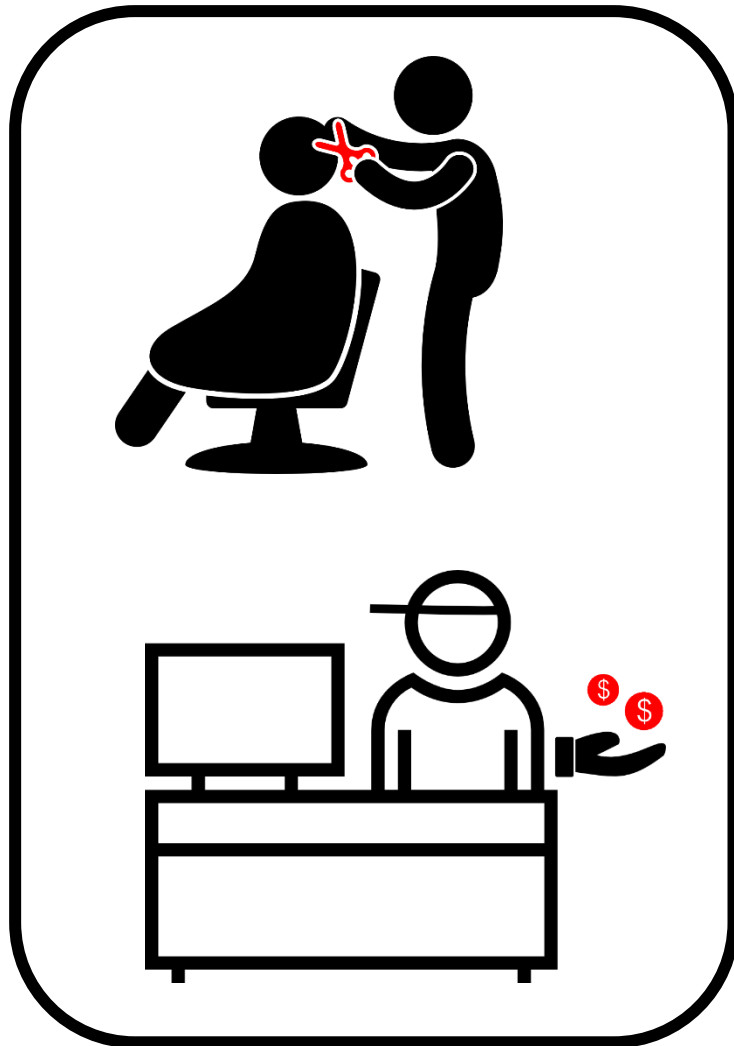
Nickel is metallo-estrogen



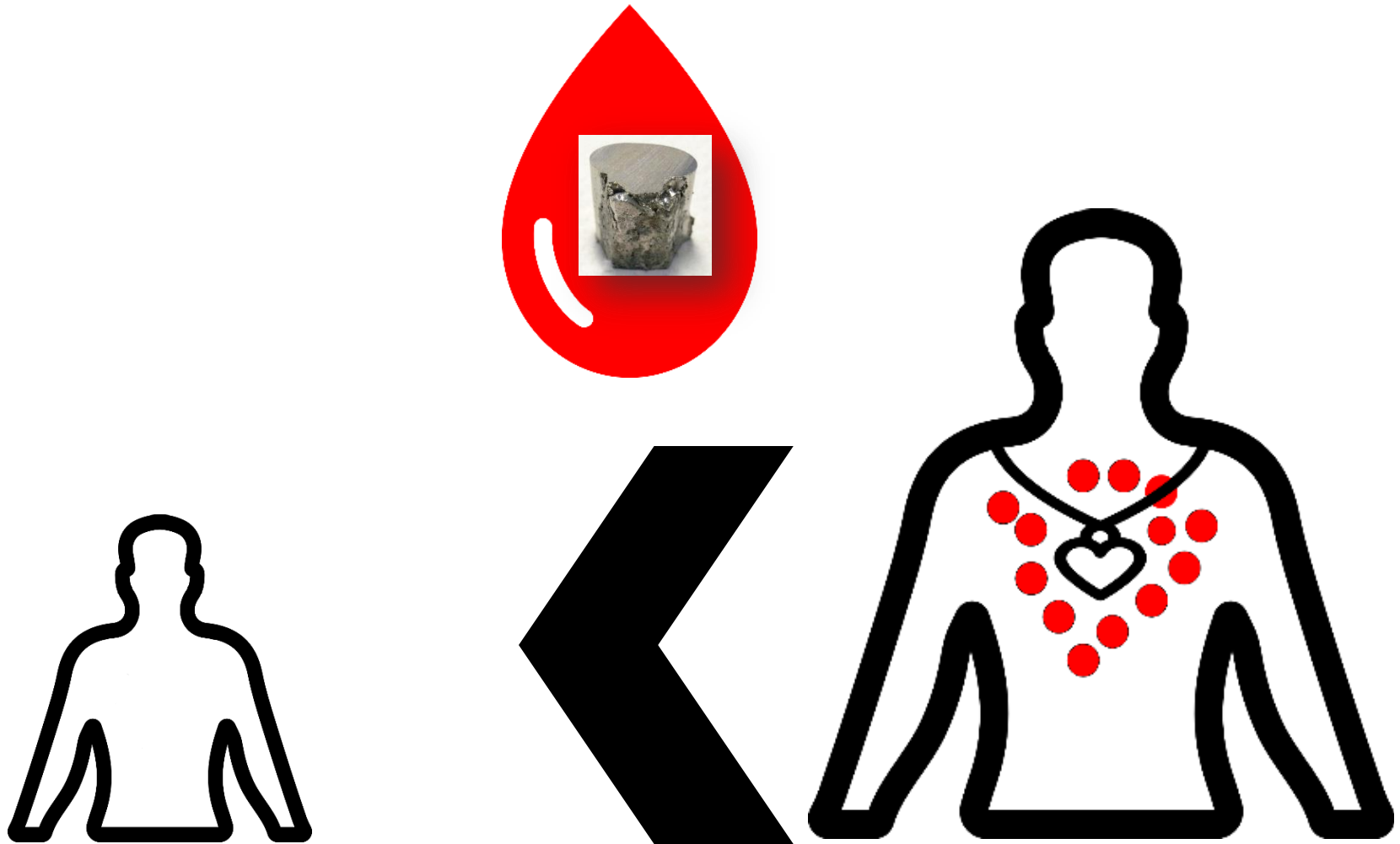
Nickel & breast cancer



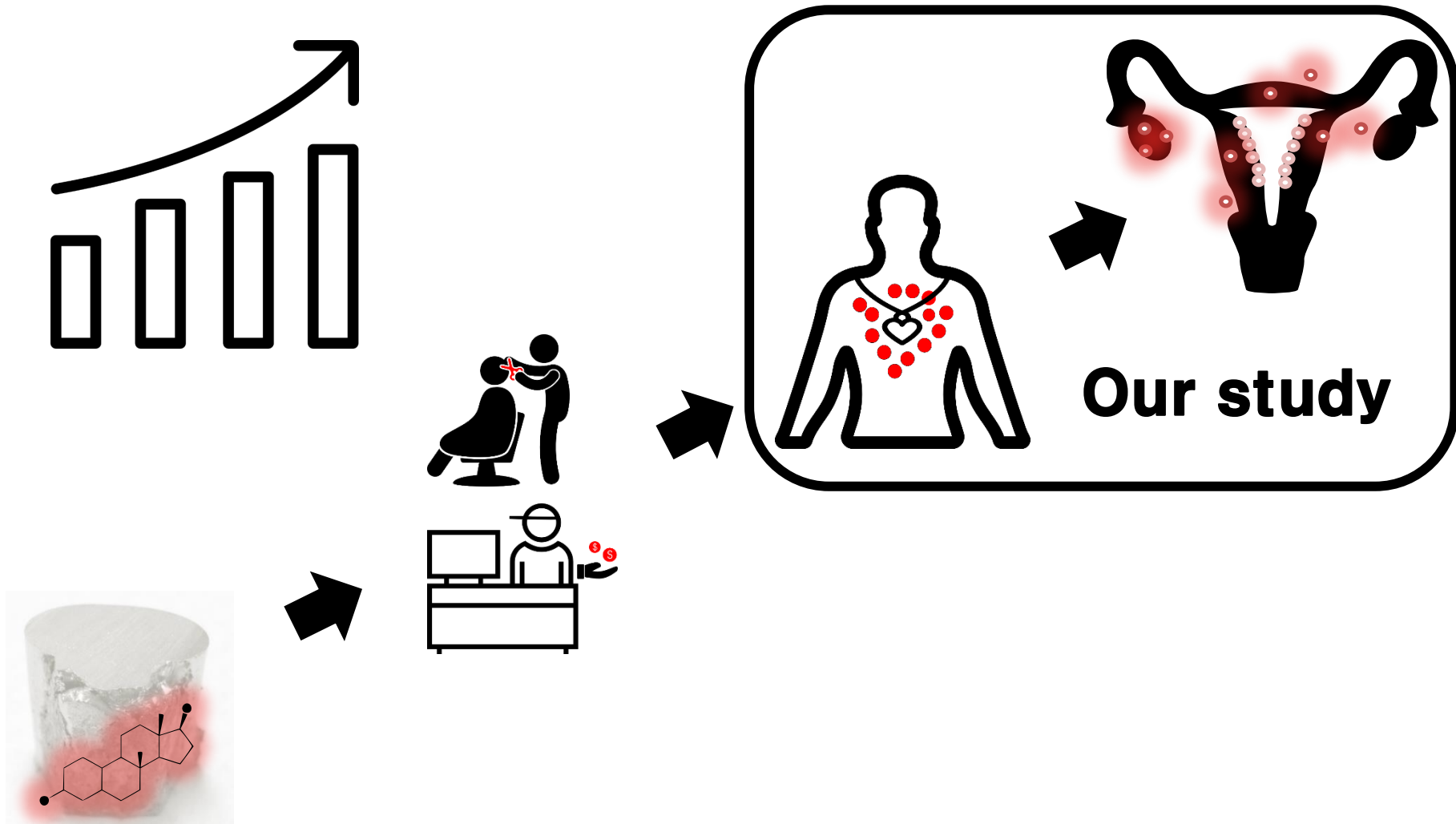
Job & Nickel allergy



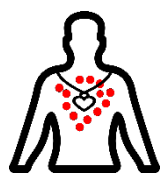
Nickel in serum



Hypothesis



EMS & Nickel allergy



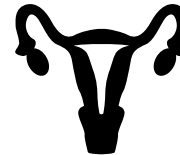
**n=8
(0.8%)**



**n=13
(0.3%)**



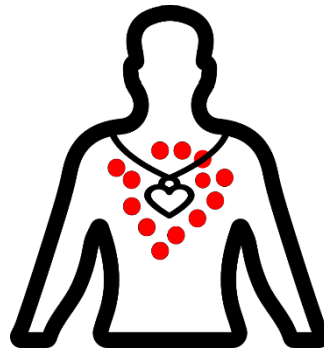
**n=997
(99.2%)**



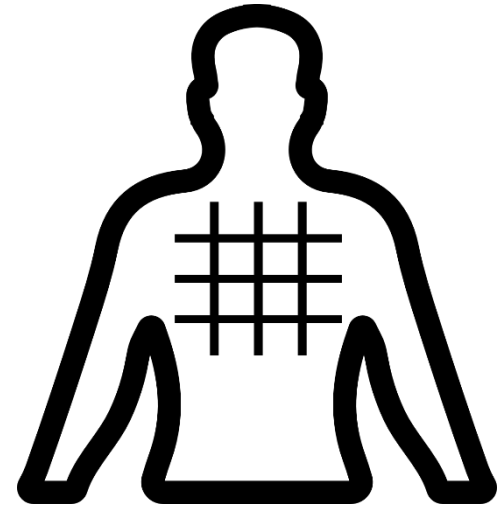
**n=3,988
(99.7%)**

Dx of Nickel allergy

Hx, PE

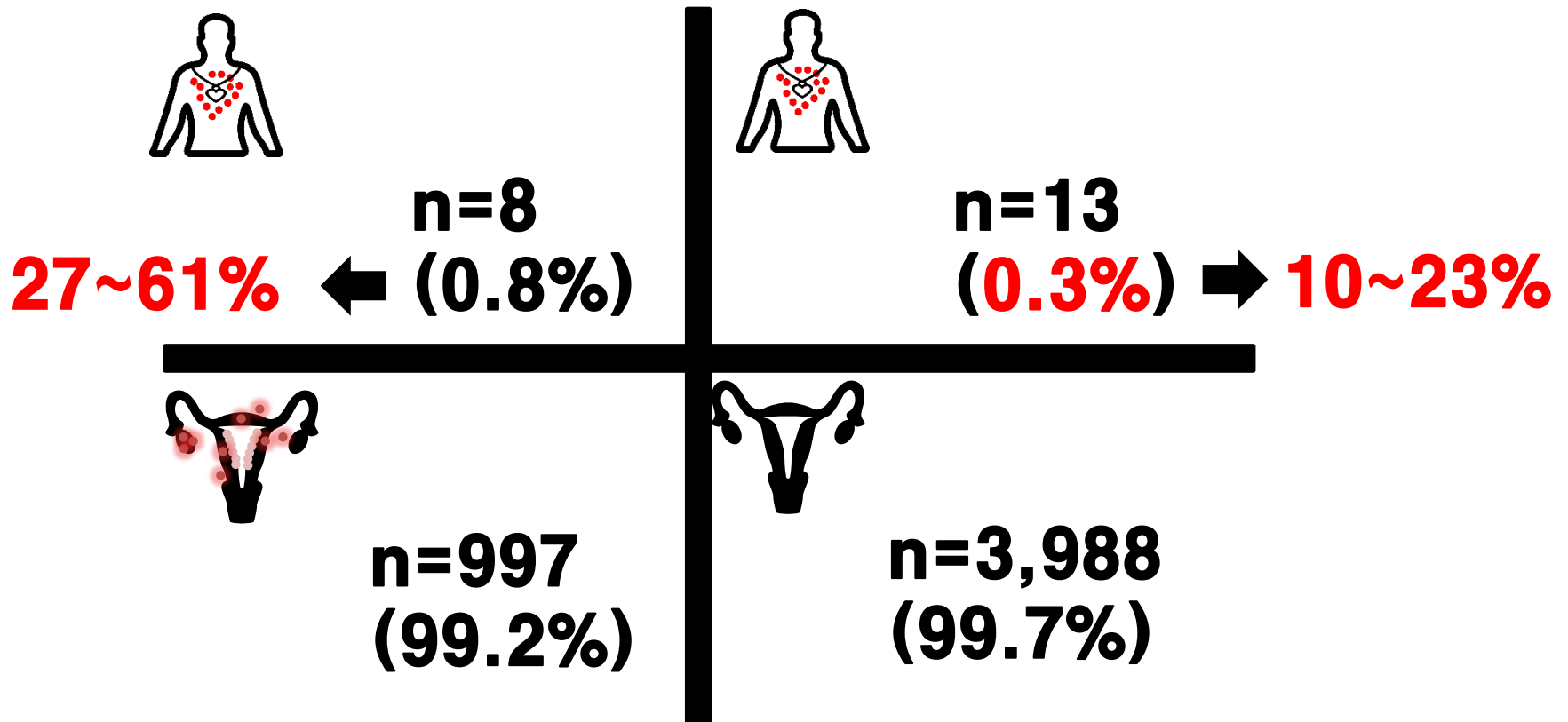


Our study
Patch test



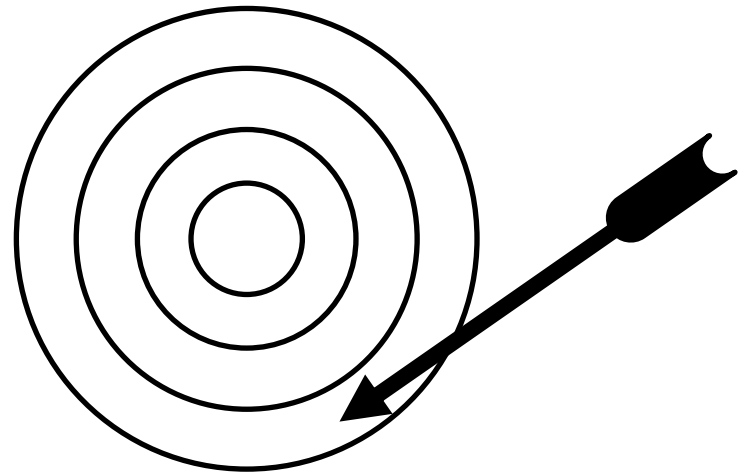
EMS & Nickel allergy

Prevalence 10~23%



Limitations

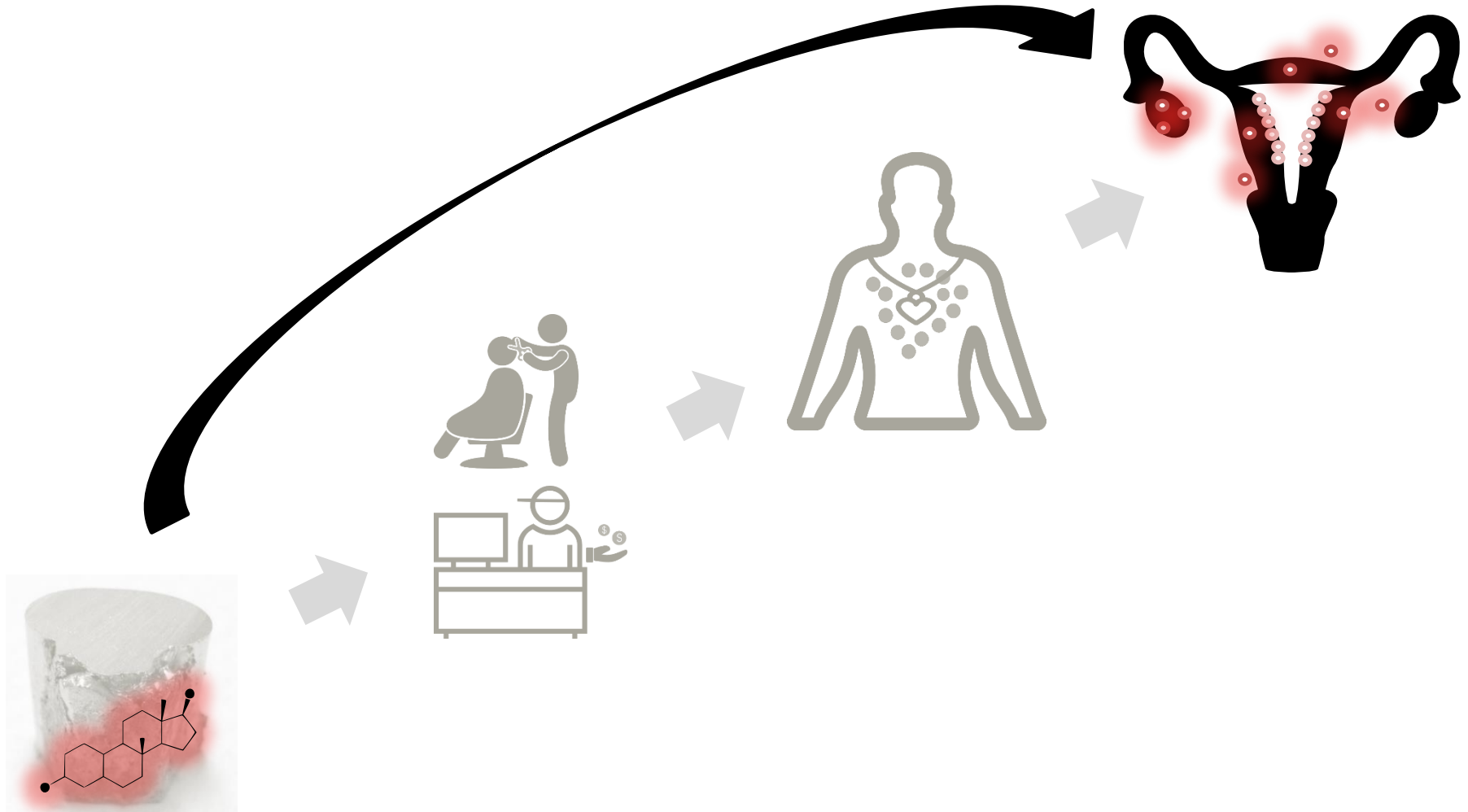
**Inaccuracy of
code**



Indirect study



Further studies



**Thank you
for your attention!!**

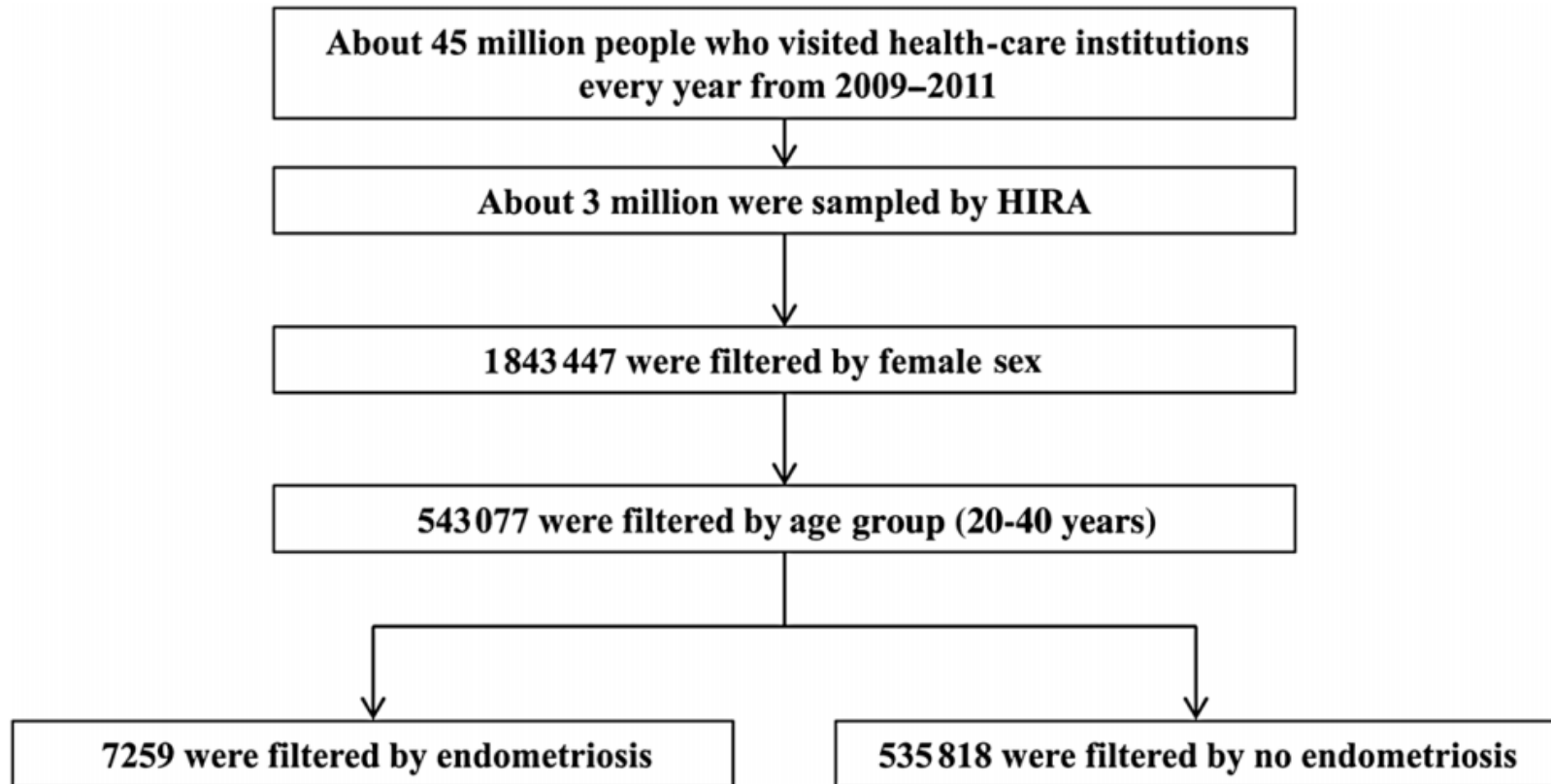


High rate of nickel allergy in women with endometriosis: A 3-year population-based study

Jin-Sung Yuk^{1,2}, Yong Jin Kim³, Kyong-Wook Yi³, Kim Tak³, Jun-Young Hur³ and Jung-Ho Shin³

¹Department of Obstetrics and Gynecology, School of Medicine, Eulji University, Daejeon, Republic of Korea ²Department of Obstetrics and Gynecology, Miz Medi Hospital, Seoul, Republic of Korea ³Department of Obstetrics and Gynecology, Korea University College of Medicine, Seoul, Republic of Korea

Cross-sectional Study



Cross-sectional Study

Table 2 Observed and expected numbers of cases of allergic diseases among women with and without endometriosis from 2009 to 2011 obtained from the National Patients Sample provided by the Korean Health Insurance Review and Assessment Service

		Endometriosis (<i>n</i> = 7259)			Non-endometriosis (<i>n</i> = 535 818)			<i>P</i> §
		Observed†	Expected‡ (%)	SE (%)	Observed†	Expected‡ (%)	SE (%)	
Contact dermatitis¶	Yes	1004	16 769 (13.9)	1016 (0.8)	68 008	2 735 826 (13.0)	15 117 (0.1)	0.26
	No	6255	103 960 (86.1)	2523 (0.8)	467 810	18 256 860 (87.0)	31 504 (0.1)	
Nickel allergy	Yes	712	12 677 (10.5)	904 (0.7)	46 704	1 867 741 (8.9)	12 601 (0.1)	0.02*
	No	6547	108 053 (89.5)	2564 (0.7)	489 114	19 124 945 (91.1)	31 778 (0.1)	
Allergic rhinitis	Yes	2789	48 684 (40.3)	1759 (1.1)	197 291	8 005 038 (38.1)	24 338 (0.1)	0.05*
	No	4470	72 046 (59.7)	2076 (1.1)	338 527	12 987 648 (61.9)	28 769 (0.1)	
Atopic dermatitis	Yes	138	2630 (2.2)	420 (0.3)	11 663	457 004 (2.2)	6313 (0.0)	0.99
	No	7121	118 099 (97.8)	2686 (0.3)	524 155	20 535 681 (97.8)	32 122 (0.0)	
Drug allergy	Yes	3	23 (0.0)	13 (0.0)	22	262 (0.0)	103 (0.0)	<0.01***
	No	7256	120 707 (100.0)	2719 (0.0)	535 796	20 992 422 (100.0)	32 204 (0.0)	

†Observed number of cases in the sample. ‡Expected number of cases in the population. §Cross-tabulations made with expected cases. *P*-values represent a χ^2 -test of the endometriosis group versus the non-endometriosis group. ¶Contact dermatitis includes nickel allergy. SE, 95% standard error.

Cross-sectional Study

Table 3 Odds ratios among women with endometriosis from 2009 to 2011 obtained from the National Patients Sample provided by the Korean Health Insurance Review and Assessment Service

	No adjustments			Adjustment for age†			Adjustments for age and other diseases‡		
	OR	95%CI	P	OR	95%CI	P	OR	95%CI	P
Contact dermatitis§	1.076	0.947–1.224	0.26	1.087	0.956–1.236	0.21			
Nickel allergy	1.201	1.036–1.393	0.02**	1.175	1.011–1.366	0.04**	1.167	1.004–1.357	0.04*
Allergic rhinitis	1.096	1.001–1.201	0.05*	1.070	0.977–1.172	0.14	1.070	0.973–1.167	0.17
Atopic dermatitis	1.001	0.728–1.376	0.99	1.093	0.795–1.502	0.59	1.059	0.770–1.456	0.73

OR for drug allergy could not be properly calculated due to too few observations. †Adjustments for covariates, such as age (per 5 years) and data year. ‡Adjustments for covariates, such as age (per 5 years), data year, nickel allergy, allergic rhinitis and atopic dermatitis. §Contact dermatitis includes nickel allergy. CI, confidence interval; OR, odds ratios.

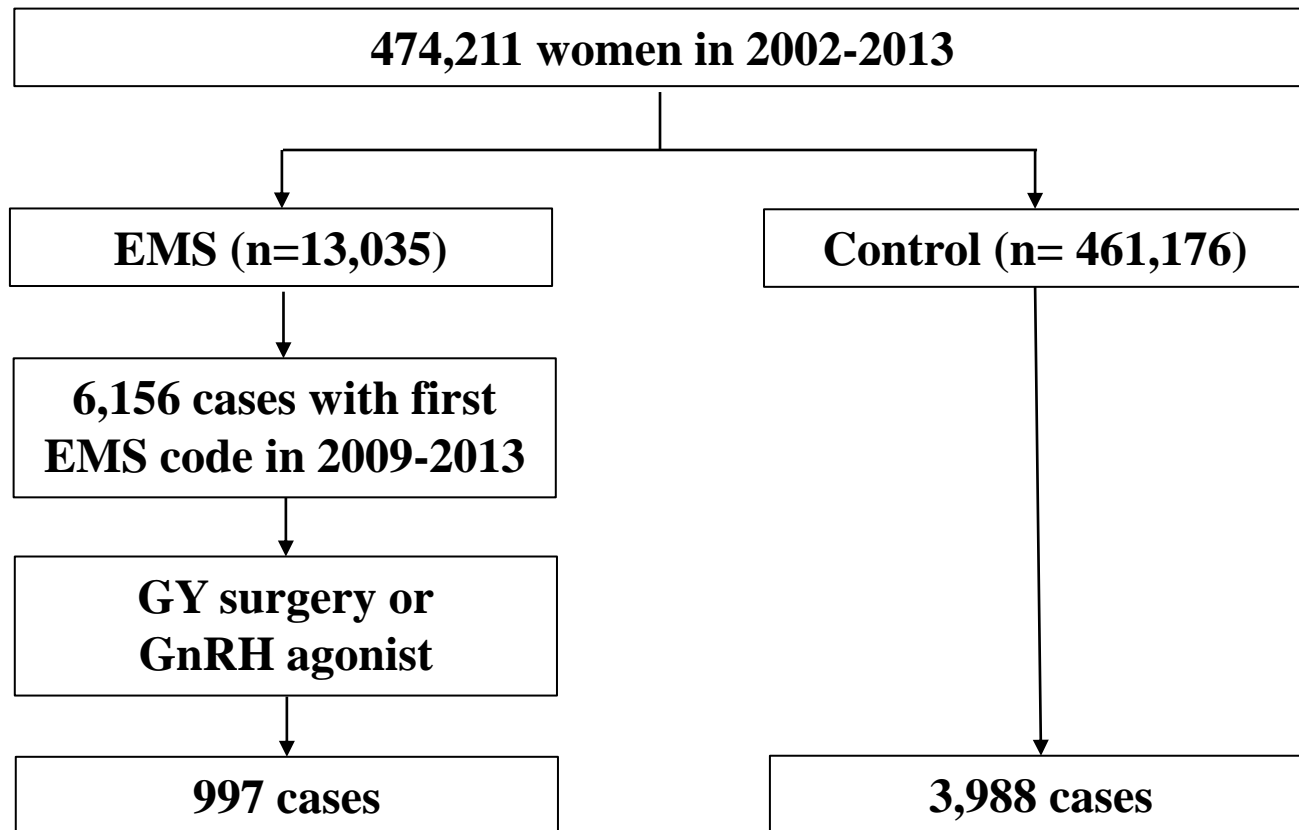
RESEARCH ARTICLE

Nickel Allergy Is a Risk Factor for Endometriosis: An 11-Year Population-Based Nested Case-Control Study

Jin-Sung Yuk^{1,2}, Jong Seung Shin³, Ji-Yeon Shin⁴, Eunsuk Oh⁵, Hyunmee Kim⁶, Won I. Park^{1*}

1 Department of Obstetrics and Gynecology, School of Medicine, Eulji University, Daejeon, South Korea, **2** Department of Obstetrics and Gynecology, MizMedi Hospital, Seoul, South Korea, **3** Department of Obstetrics and Gynecology, Hyundai UVIS hospital, Incheon, South Korea, **4** Department of Preventive Medicine, School of Medicine, Eulji University, Daejeon, South Korea, **5** Department of Internal Medicine, MizMedi Hospital, Seoul, South Korea, **6** Department of Family Medicine, MizMedi Hospital, Seoul, South Korea

Selection of subjects



1:4 matching

Demographics

Table 1. Characteristics of patients in the endometriosis group and the control group, 2002–2013.

	EMS group	Control group	Total	p-value
Number of patients	997	3,988	4,985	
2009 ^a	183			
2010 ^a	198			
2011 ^a	198			
2012 ^a	201			
2013 ^a	217			
Mean age group ^b	8.5±1.8	8.5±1.9	8.5±1.8	1
Mean age (years) ^c	42.6±9.2	42.6±9.3	42.6±9.3	
Mean group socioeconomic status ^d	6.0±2.9	6.0±2.9	6.0±2.9	1
Nickel allergy				0.052 ^e
Present	8 (0.8%)	13 (0.3%)	21	
Not present	989 (99.2%)	3975 (99.7%)	4964	

^a First diagnosis of EMS was made in the year noted.

^b Mean age groups per 5 years in 2013. 1; 0–4 years, 2; 5–9 years,, 17; 80–84 years, 18; 85 years+.

^c The mean age was calculated from the mean age groups per 5 years.

^d Mean socioeconomic status groups in 2013. 1; upper 0–9%, 2; upper 10–14%,, 9; upper 90–94%, 10; upper 95%+.

^e Fisher's exact test

Data are presented as numbers or means ± standard deviations

EMS & Nickel allergy

Table 2. Multivariate logistic regression analysis of endometriosis and nickel allergy.

Adjustment	Adjusted OR ^a	
	OR (95% CI)	p-value
Age group per 5 years	1.001 (0.964~1.039)	0.977
Socioeconomic status group (decile)	1.000 (0.976~1.024)	0.977
Nickel allergy	2.474 (1.023~5.988)	0.044

^a Covariates: Age group per 5 years, socioeconomic status group (decile), nickel allergy.
CI, Confidence interval; OR, Odds ratio