Association between PCOS and Endometriosis by Comorbiditiy analysis : The National Health Insurance Service-National Sample Cohort Study

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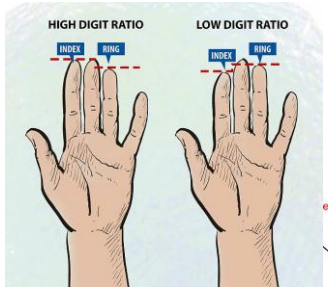
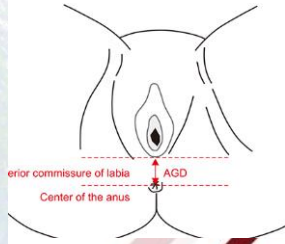
Introduction

- **Systemic diseases**
  - **Polycystic Ovary Syndrome(PCOS)** is linked to obesity, type 2 diabetes, dyslipidemia, and cardiovascular disease.
  - In **endometriosis**, cytokines creates a widespread inflammatory environment extending outside the pelvis

- Endometriosis ↓ **BMI** ↑ PCOS

- PCOS and Endometriosis are **diametric disorders**
  - Adverse prenatal testosterone levels -> Effect on HPO axis
  - Digit ratio, Anogenital distance



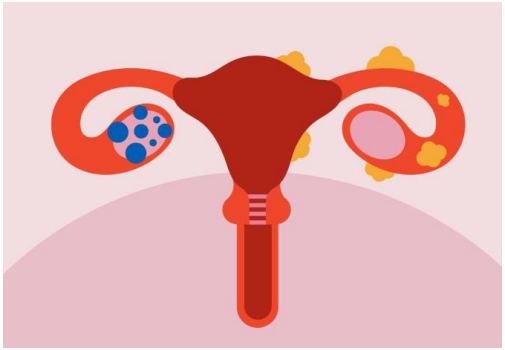


Endometriosis and polycystic ovary syndrome are diametric disorders. Dinsdale NL, Crespi BJ. Evol Appl. 2021 May 14;14(7):1693-1715. doi: 10.1111/eva.13244. eCollection 2021 Jul.

Objective

- Further research is required to evaluate whether PCOS and Endometriosis are diametric diseases.
- **The inverse comorbidity** :

  Higher prevalence of one disorder should show lower prevalence of the other.



●The objective

: **To investigate the relationship in between PCOS and the Endometriosis through comorbidity analysis in Korean women.**

Materials and Methods

- **National Health Insurance Service- National Sample cohort** (2002-2013)

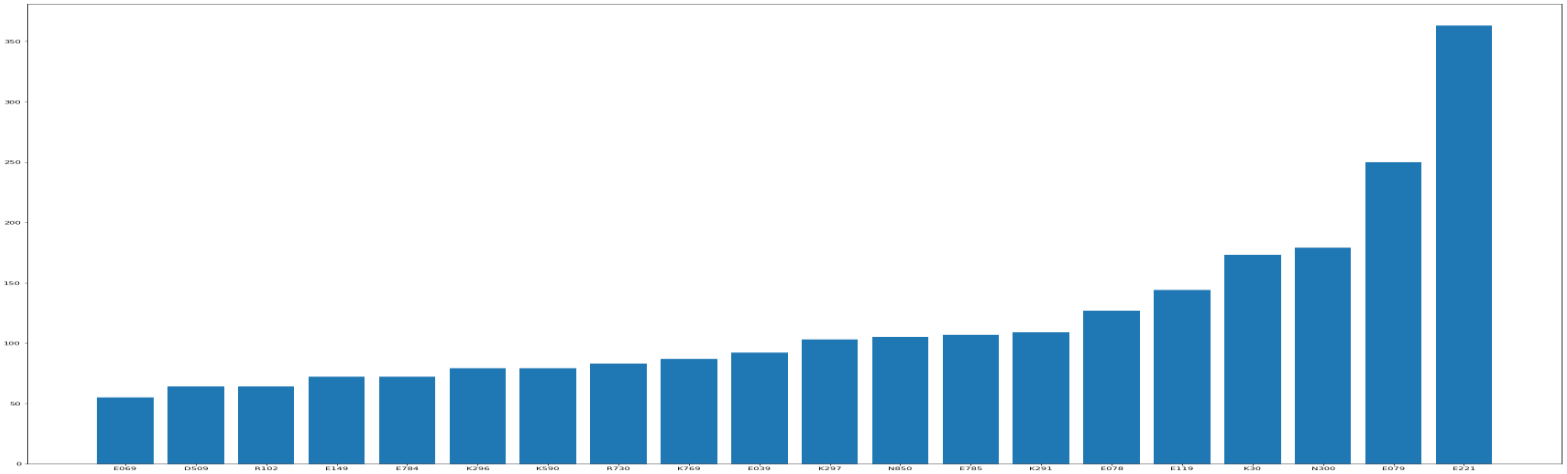
- From 1,025,340 patients throughout South Korea
  - 14,235 Of **PCOS** / 27,865 of **Endometriosis** patients

- Identified all comorbidities based on ICD codes.
- Removed code (Vaginitis, Infertility, PCOS, Endometriosis)

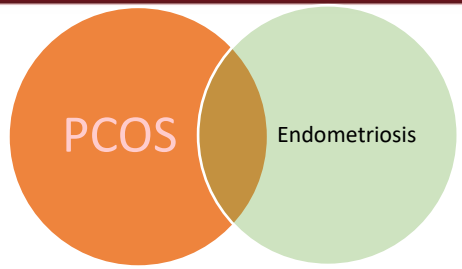
- Statistic analysis: chi-square test

Results

PCOS Comorbidities

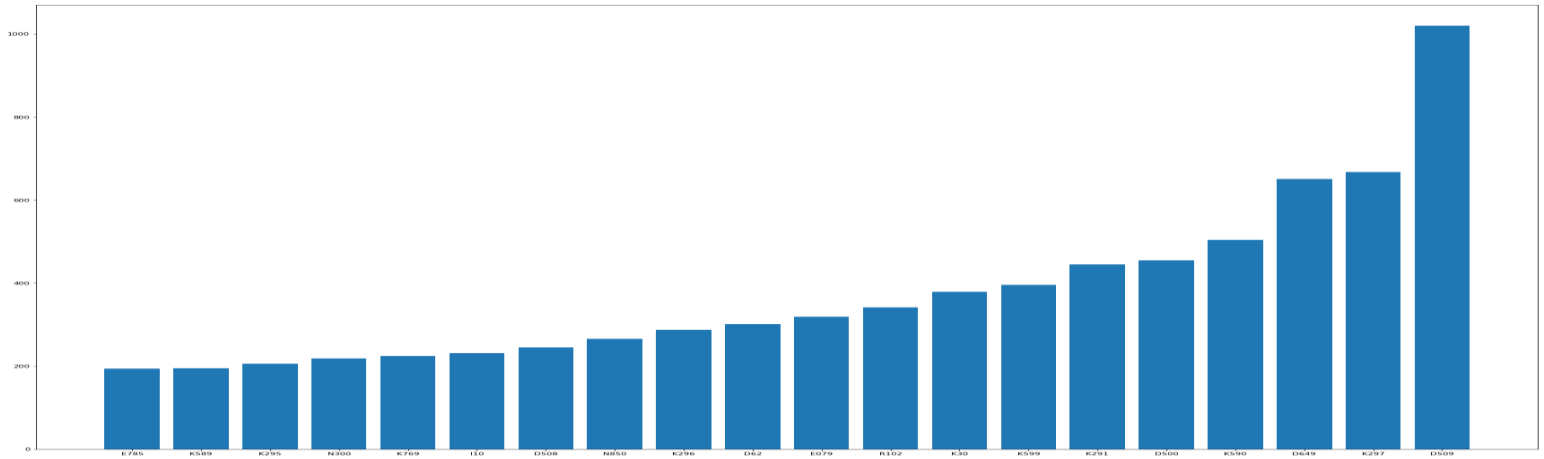


Essential hypertension
Thyrotoxicosis
Low back pain
Galactorrhea
Thyroiditis, unspecified
Iron deficiency anaemia
Pelvic and perineal pain
Constipation
Abnormal glucose tolerance test
Liver disease
Hypothyroidism
Endometrial hyperplasia
Hyperlipidaemia
Gastritis
Sick-euthyroid syndrome
Type 2 diabetes mellitus
Dyspepsia
Acute cystitis
Disorder of thyroid
Hyperprolactinaemia



Results

Endometriosis Comorbidities

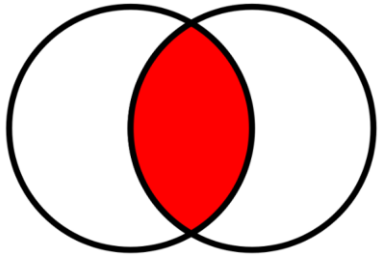


Iron deficiency anaemia
Gastritis
Constipation
Functional intestinal disorder
Dyspepsia
Pelvic and perineal pain
Disorder of thyroid
Posthaemorrhagic anaemia
Endometrial glandular hyperplasia
Hypertension
Fatty liver
Acute cystitis
Chronic gastritis
Irritable bowel syndrome
Hyperlipidaemia
Hypercholesterolaemia
Stress incontinence
Liver disease
Type2 Diabetes Mellitus
Dysuria

PCOS

Endom etriosis

Results – Similar comorbidities



- ✓ Gastrointestine
  - Dyspepsia
  - Noninfective gastroenteritis
- ✓ Respiratory
  - Acute bronchitis
- ✓ Endocrine
  - Thyrotoxicosis
  - Benign neoplasm of thyroid gland
  - Nontoxic single thyroid nodule
  - Disorder of lipoprotein metabolism
- ✓ Cardiology
  - Angina pectoris
  - Heart burn
  - Hypotension
  - Peripheral vascular disease
- ✓ Nephrology
  - Acute tubulo-interstitial nephritis
  - Unspecified hematuria
  - Disorders of electrolyte and fluid balance
- ✓ Genitourinary
  - Abscess of Bartholin's gland
  - Malignant neoplasm of endometrium
  - Carcinoma in situ of endocervix
- ✓ Musculoskeletal
  - Cervical disc disorder with radiculopathy
- ✓ Allergy/Dermatology
  - Allergic contact dermatitis
  - Urticaria, unspecified
  - Allergic rhinitis

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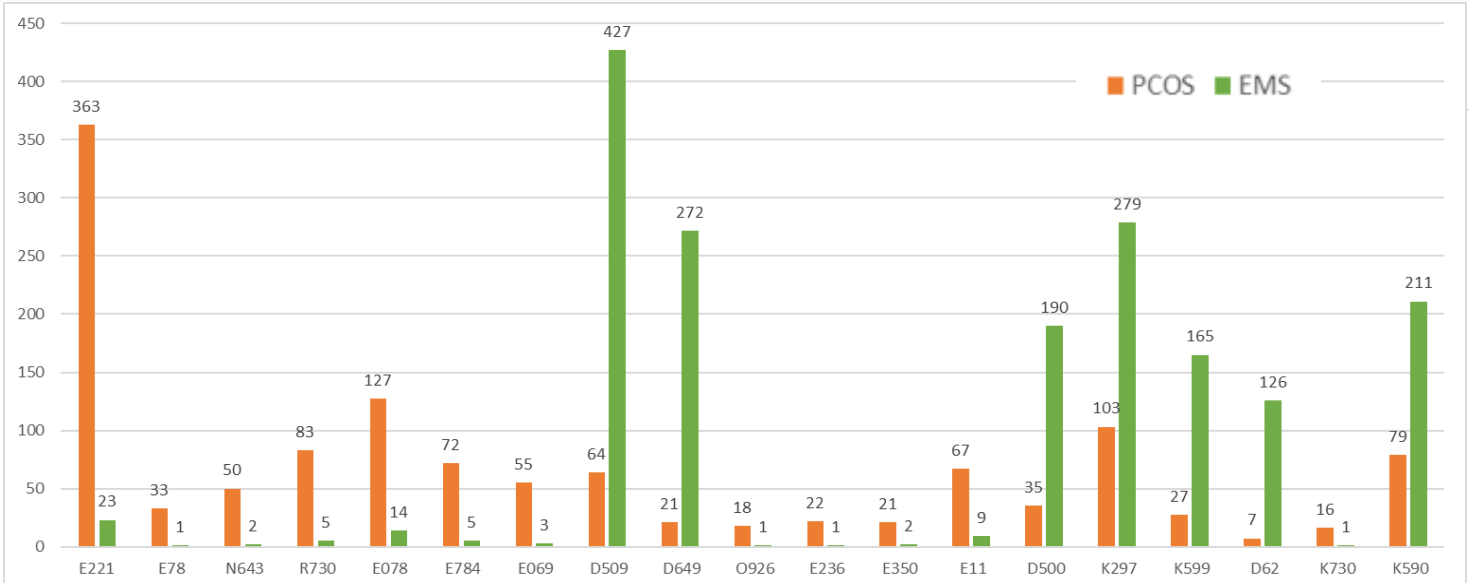
Results – Inverse comorbidities



Hyperprolactermia

Disorders of lipoprotein

Galactorrhoea

Abnormal glucose tolerance test

Sick-euthyroid syndrome

Hyperlipidaemia

Thyroiditis

Iron deficiency anaemia

Anemia

Galactorrhoea, delivered

Disorders of pituitary gland

Disorders of thyroid gland

Diabetes mellitus

Vitamin A def with conjunctival xerosis

Gastritis

Functional intestinal disorder

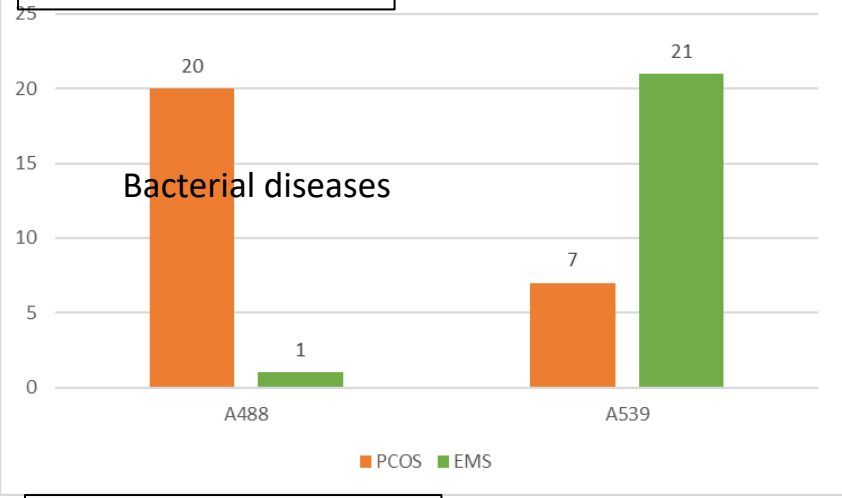
Posthaemorrhagic anaemia

Chronic hepatitis

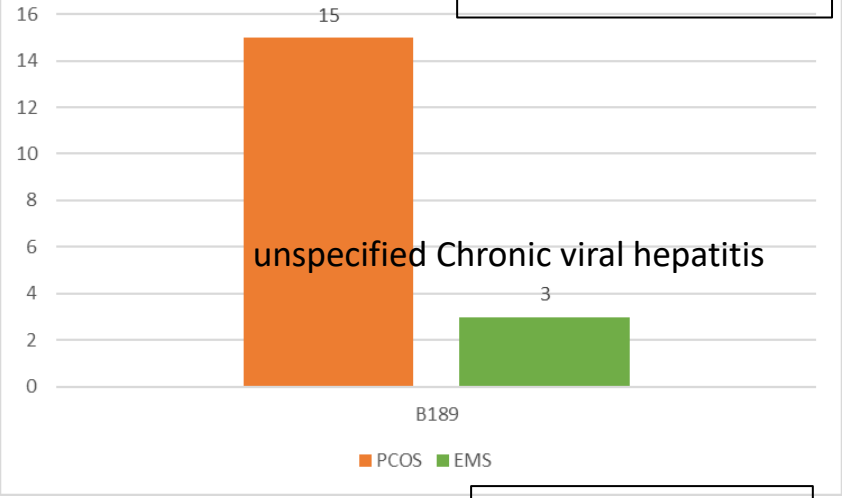
Constipation

Results – Inverse comorbidities

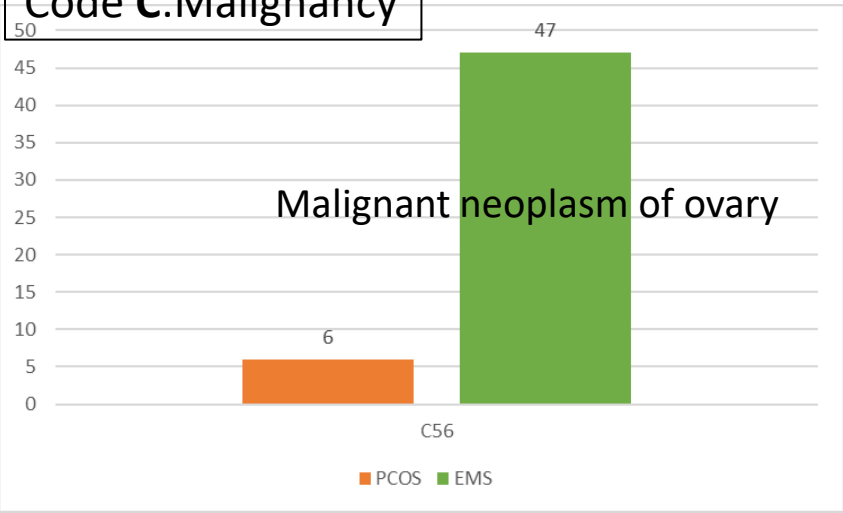
Code **A**: infection



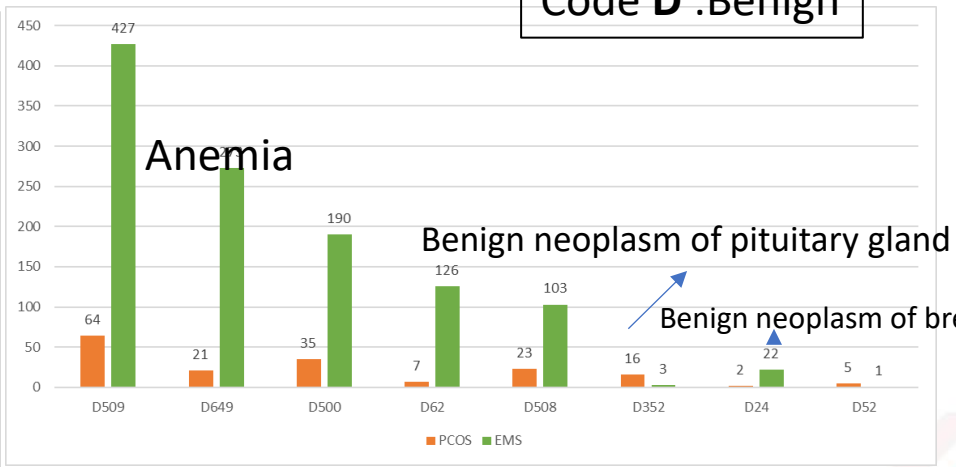
Code **B**: infection



Code **C**:Malignancy

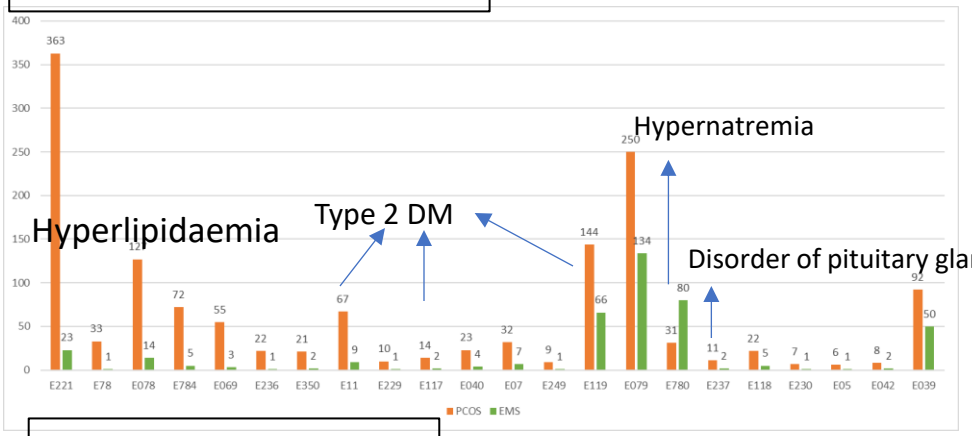


Code **D** :Benign

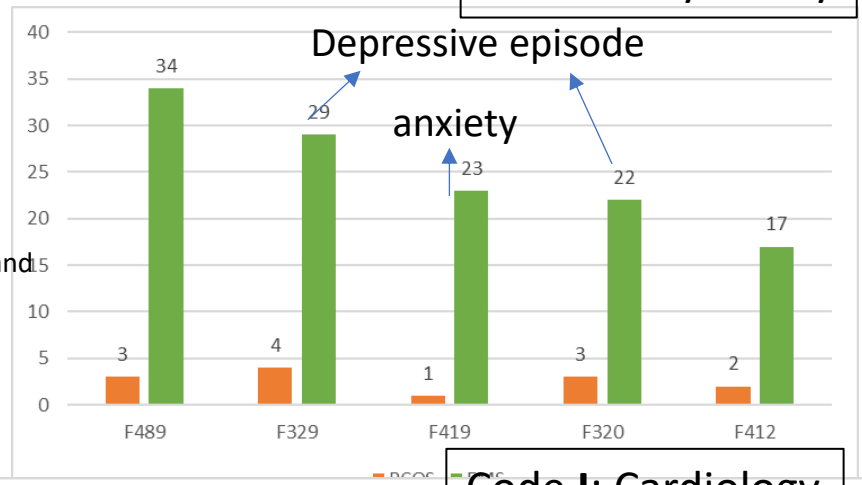


Results – Inverse comorbidities

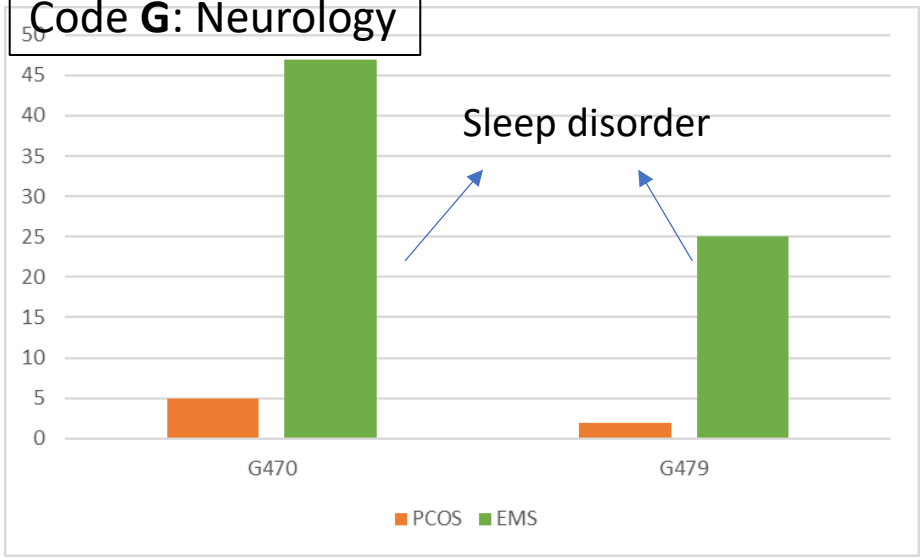
Code **E**: Endocrinology



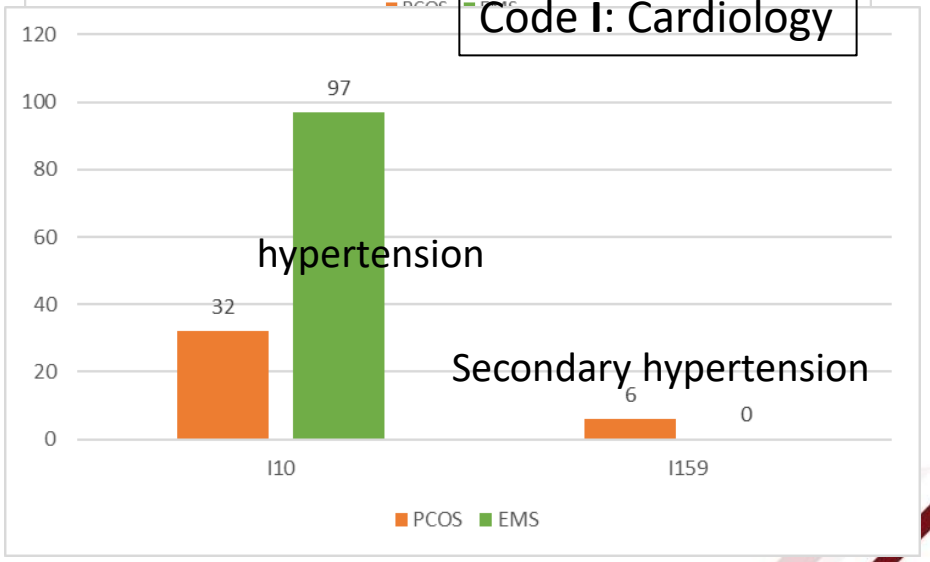
Code **F**: Psychiatry



Code **G**: Neurology

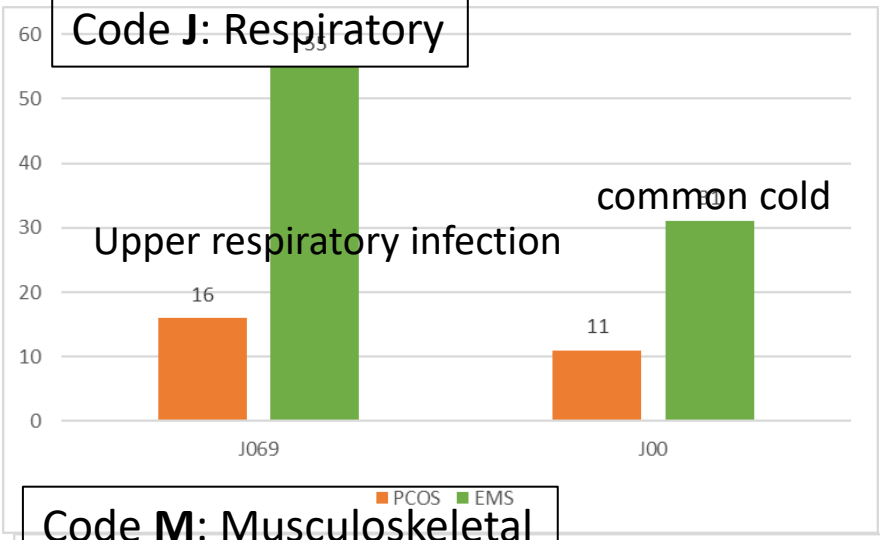


Code **I**: Cardiology

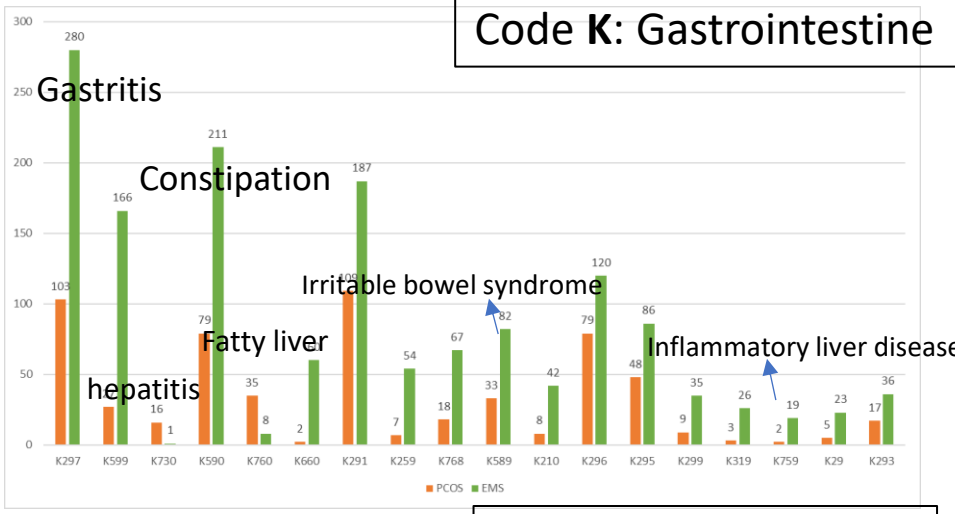


Results – Inverse comorbidities

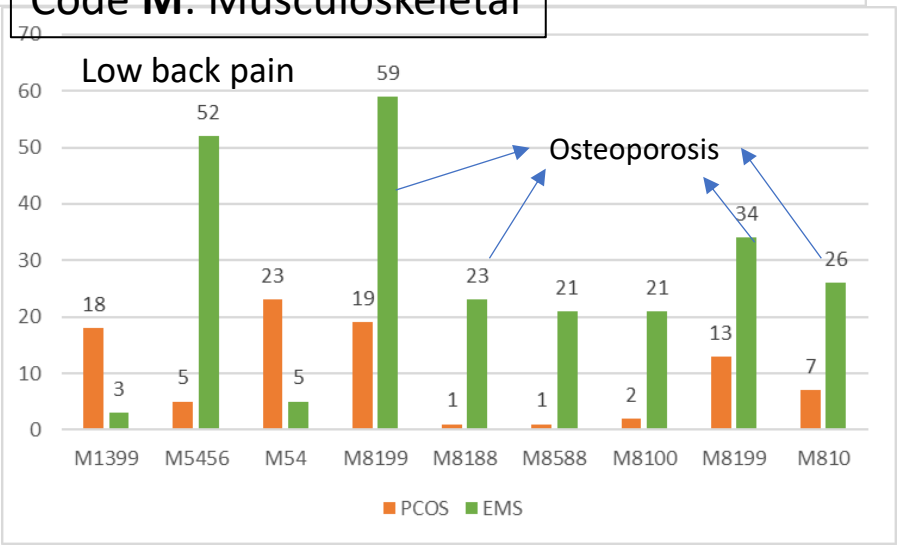
Code **J**: Respiratory



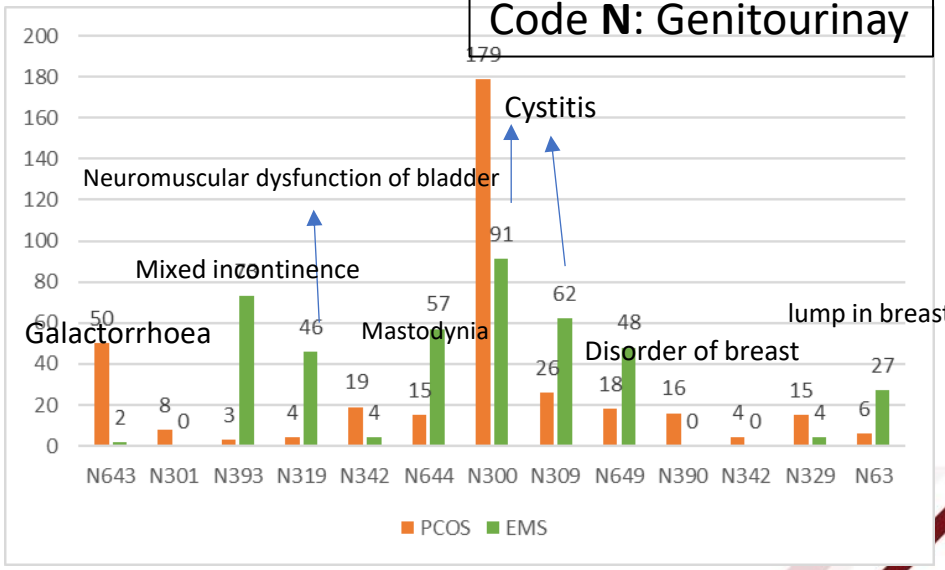
Code **K**: Gastrointestine



Code **M**: Musculoskeletal

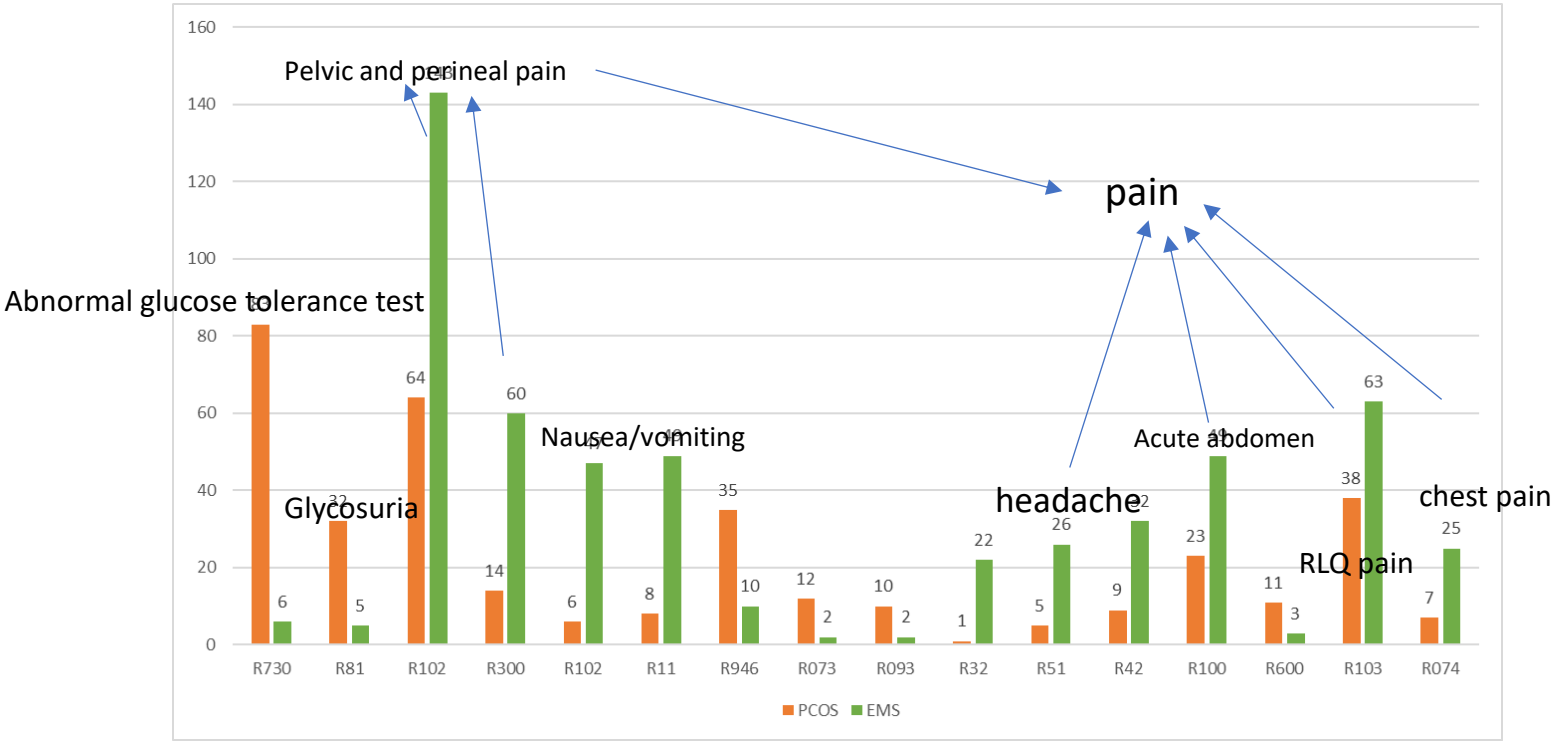


Code **N**: Genitourinay

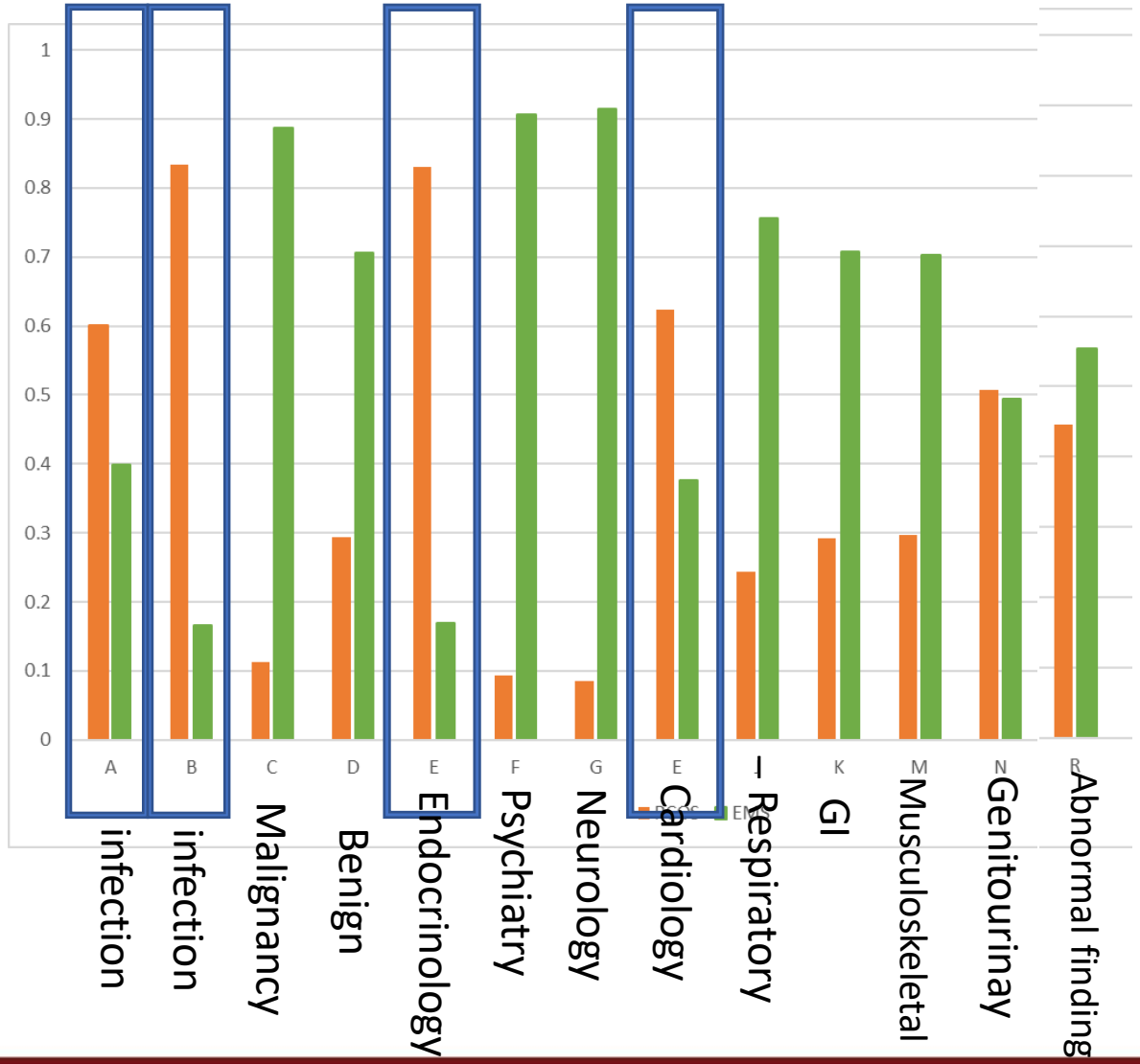


Results – Inverse comorbidities

Code **R**: Abnormal finding



Results – Inverse comorbidities



Discussion

- The primary direction of this study was showing a higher prevalence of PCOS should alse demosnstrate lower prevalence of endometriosis.

- 343 diseases shows similar comorbidities
- 108 diseases shows inverse comorbidities

- By categorizing, Psychiatric, Neurologic, Cardiologic, GI, Musculoskeletal, Breast disease, Urinary incontinence disease are **more common in Endometriosis** rather than PCOS

Discussion

- Strength
  - Large sized cohort study
  - Analyzing caterogized disease
- Limitation
  - Uncertainties regarding the age correction
  - Diseases that are associated with testosterone are rare

Conclusion

- In Korean women with PCOS and Endometriosis, there are some considerable differences in the tendency of accompanying diseases, and some have observed conflicting results.

- **It is not yet clear whether the comorbidity of PCOS and Endometriosis tend to be the opposite**, so further research is needed.

THANK YOU