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PREVALENCE AND INCIDENCE OF CLINICALLY DIAGNOSED KNEE, HIP AND HAND OSTEOARTHRITIS IN WOMEN WITH POLYCYSTIC OVARY SYNDROME: A NATIONAL REGISTER-BASED STUDY

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Abstract:

Purpose: Osteoarthritis (OA) is the most common form of arthritis associated with high morbidity and increased risk of early cardiovascular mortality. Obesity is associated with metabolic dysregulation and an increased risk of developing OA even in non-weight bearing joints. Polycystic ovary syndrome (PCOS) is a very common endocrinology problem among women associated with reproductive and metabolic features, and as a result, these women have increased risk of stroke and thrombosis when compared with a general population. Assessing incidence and prevalence of OA in this group represent a great natural experiment for testing association between metabolic dysregulation and risk of OA. The main objective of this study was to investigate the prevalence and incidence risk of clinically diagnosed OA affecting different site(s) (knee, hip and hand) in PCOS compared to a control population.

Methods: A PCOS cohort based on a Danish national register (NPR) study was compared with matched controls. All incident PCOS cases were defined according to the Rotterdam criteria and/or diagnosis of hirsutism, and were based on the International Classification of Diseases (ICD) 10 codes from the Danish NPR available between 1995 and 2012. Women in the control cohort were randomly selected, matched 1:3 to PCOS cases on age and index date. The outcome was clinically diagnosed knee, hip and hand OA according to the ICD-10 codes. Incidence rates of clinical OA were estimated in women with and without PCOS, both overall and per age categories. Person-time at risk for each woman was estimated as the time each woman remains free of OA during the follow-up period (up to 17 years). Hazard ratio (HR) and 95% confidence of intervals (CIs) were assessed to estimate the risk of OA at the three different joints in PCOS cohort compared to the control group. Cox proportional hazard regression was used.

Results: Data was available for 75,089 patients: 18,923 women with PCOS and 56,166 controls, with a median age of 29 years (24-36). During the observation period (median follow-up of 11.1 years (range: 6.9-16.0)), 2,253 women were identified with OA, 4.3% and 2.6% in the PCOS and control cohorts, respectively. A high prevalence at index date for Charlson comorbidity and cardiometabolic diseases were observed in the PCOS cohort, including obesity, diabetes, dyslipidaemia and hypertension. In 2012, the most prevalent joint OA was knee OA (4.9%), followed by hip OA (1.6%) and then hand OA (0.5%). Significant higher incidence rates were observed in PCOS cohort compared with the control cohort (2.8 vs. 1.5, 0.8 vs. 0.6 and 0.3 vs. 0.1 cases per 1000 person years, for knee, hip and hand, respectively) (Table 1). The hazards of developing OA was 90% higher (HR 1.9, 95% CI: 1.7 to 2.1) for knee, 30% (HR 1.3, 95% CI: 1.1 to 1.6) for hip and 80% (HR: 1.8, 95% CI: 1.3-2.4) for hand (Table 1) in PCOS cohort compared to the control cohort. There was a trend between higher incidence rates of knee, hip and hand OA and greater age. Women at the age of 50-60 were more likely to develop OA than those younger than 45 years old.

Conclusions: Women with PCOS have a greater risk of OA when compared to the control population. Given the high risk of metabolic syndrome (MetS) in PCOS population, understanding their metabolic profile, including metabolomics, might provide us with a better understanding of the shared pathogenesis of MetS and OA. Furthermore, this population might also benefit more from targeted secondary prevention for both OA and MetS. Weight loss and exercise interventions are already recommended as first line treatment for PCOS. Further investigations into the effects of modifiable risk factors on OA are

Table 1. Incidence rates per 1000 person-year (PY) for clinically diagnosed joint osteoarthritis (OA) between PCOS patients and controls

Joint	PCOS (N=18,923)		Controls (N=56,166)		Unadjusted HR* (95% CI)	p-value
	N° of events	Incidence rate per 1000 PY (95%CI)	N° of events	Incidence rate per 1000 PY (95%CI)		
Knee OA	588	2.8 (2.5 to 3.0)	951	1.5 (1.4 to 1.6)	1.9 (1.7 to 2.1)	<0.001
Hip OA	173	0.8 (0.7 to 0.9)	390	0.6 (0.6 to 0.7)	1.3 (1.1 to 1.6)	0.004
Hand OA	55	0.3 (0.2 to 0.3)	96	0.1 (0.1 to 0.2)	1.8 (1.3 to 2.4)	0.001

*Reference=control group.

PCOS= Polycystic ovary syndrome; HR=Hazard Ratio

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