Published in final edited form as:

Pediatr Dermatol. 2018 September ; 35(5): e304–e305. doi:10.1111/pde.13539.

Association between obesity and pediatric psoriasis

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Abstract

Obese children are at higher risk of developing psoriasis, and obesity severity correlates with psoriasis severity. The relationship between obesity and pediatric psoriasis was explored in a well-defined population. Obesity and psoriasis coexist at diagnosis and that obesity likely precedes psoriasis in children.

Keywords

Obesity; psoriasis; children

Report

Obese children are at higher risk of developing psoriasis, and obesity severity correlates with psoriasis severity (1). Studies based on claims data have also shown that pediatric psoriasis may be associated with an increased risk of hyperlipidemia, hypertension and diabetes (2); however, the idea of “which comes first” between psoriasis and obesity, as well as the relative contribution of obesity and psoriasis on these risks is unclear. We explored the relationship between obesity and pediatric psoriasis in a well-defined population. The Rochester Epidemiology Project resources were used to identify 550 children aged <18 years diagnosed with psoriasis between January 1, 1970 and December 31, 2014 (3). Medical records were reviewed for accuracy of psoriasis diagnosis and incidence date. Children with psoriasis were age and sex matched to 1100 children without psoriasis. Each matched subject was assigned an index date. Body mass index (BMI) at incidence/index date was retrieved and obesity was defined as BMI > 85th percentile. Age and sex-adjusted conditional logistic regression models were used to compare the prevalence of comorbidities before psoriasis incidence/index date between the two cohorts. Age, sex, and calendar-year

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Consent for publication has been gained from all of the mentioned authors No conflicts of interests

adjusted Cox proportional hazards regression models were used to examine the risk of developing co-morbidities in the cohort of children with psoriasis and the reference cohort of patients without psoriasis. Children with psoriasis were more likely to be obese at the time of psoriasis diagnosis compared with children without psoriasis (odds ratio 2.58, 95% CI 1.48–4.52). Following psoriasis diagnosis, children with psoriasis had a higher risk of developing arthritis compared with children without psoriasis (hazard ratio 8.17, 95% CI 3.36–19.86). The associations of other co-morbidities at incidence/index date and the risk of these comorbidities after the diagnosis of psoriasis are summarized in Tables 1 and 2. These data demonstrate that children with psoriasis are more likely to be obese prior to psoriasis diagnosis than children without psoriasis and in those who are not obese at the time of psoriasis diagnosis, equally likely to develop obesity after psoriasis diagnosis as compared to children without psoriasis, thus supporting the notion that obesity is indeed a risk factor for psoriasis development rather than the reverse. A similar conclusion was reported by Paller et al, who found that obesity preceded psoriasis in 93% of their cohort of overweight or obese children with psoriasis (4).

In addition, the rate of comorbidity development in the psoriasis cohort was not higher than the non-psoriasis cohort, with the exception of arthritis, which is in contrast to several recent studies (5). This may in part be due to the relatively small cohort sizes, thus making it more difficult to detect a difference. However, while other studies are largely based on claims data, in this study, diagnoses and comorbidities were confirmed by manual chart review.

Limitations of this study include predominantly Caucasian population limiting generalizability, retrospective study design and limited power due to small cohort size. Comorbidities were not routinely screened early on and given the change in the management of psoriasis over the years, may be a potential confounding variable. We have shown that obesity and psoriasis coexist at diagnosis and that obesity likely precedes psoriasis in children. While further prospective longitudinal studies are needed to confirm this relationship, efforts aimed at early intervention and prevention of childhood obesity may help reduce psoriasis disease burden and subsequent morbidity and mortality.

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Table 1:

Associations of a history of comorbidities with psoriasis

Comorbidity	Non-psoriasis Controls N=1,100 (%)	Psoriasis Cases N=550 (%)	Odds Ratio (95% CI)	P-value
Arthritis	3 (<1)	4 (1)	2.86 (0.63–12.90)	0.17
Cardiovascular disease	0	0	NE	NE
Diabetes mellitus	7 (1)	5 (1)	1.54 (0.48–4.90)	0.47
Hyperlipidemia	9 (1)	6 (1)	1.48 (0.52–4.21)	0.46
Hypertension	3 (<1)	2 (<1)	1.45 (0.24–8.77)	0.68
Metabolic syndromes	0	0	NE	NE
Obesity	24 (2)	30 (5)	2.58 (1.48–4.52)	<0.001

NE: Not estimated since fewer than 5 patients had a history of the comorbidity listed.

Table 2:

Risk of selected comorbidities during follow-up of children with psoriasis and a matched cohort without psoriasis

Comorbidity	With Psoriasis		without Psoriasis		Hazard Ratio (95% CI)	P value
	n / N	Median IQR	n / N	Median IQR		
Arthritis	27 / 539	19.8 (6.4–29.0)	6 / 1,044	15.4 (11.8–23.1)	8.17 (3.36–19.86)	<0.001
Cardiovascular disease	6 / 543	30.7 (28.7–33.1)	10 / 1,055	31.1 (27.8–34.2)	0.31 (0.87–2.40)	0.78
Diabetes mellitus	44 / 538	17.5 (10.1–27.3)	59 / 1,039	20.4 (13.8–30.8)	1.28 (0.87–1.89)	0.22
Hyperlipidemia	57 / 537	18.9 (13.6–31.4)	89 / 1,034	18.1 (9.8–25.7)	0.99 (0.71–1.38)	0.93
Hypertension	52 / 541	14.4 (6.6–28.5)	62 / 1,048	17.6 (10.8–26.0)	1.42 (0.98–2.06)	0.062
Metabolic syndromes	2 / 543	15.2; 21.2	5 / 1,055	17.2 (1.0–20.2)	0.70 (0.14–3.61)	0.67
Obesity	79 / 513	11.1 (5.0–21.9)	113 / 976	12.0 (6.1–20.0)	1.22 (0.91–1.62)	0.18

* n = no of subjects with or without the aforementioned comorbidity

** N = total number of subject with or without psoriasis. Subjects with a history of the co-morbidity were excluded.