Within Kaiser Permanente Northern California, we identified 128,953 adolescent girls aged 10 to 17 years with a well-child visit during 2012 to 2014. This retrospective study was approved by the institutional review board with a waiver of informed consent. We used measured height and weight to calculate BMI, expressed as BMI percentile. Underweight subjects (BMI less than the fifth percentile) were excluded. Diagnoses of acne (*International Classification of Diseases, Ninth Revision* code 706.1) within 1 year of the visit were ascertained from pediatrics, family medicine, and dermatology clinic visits. The proportion of patients with diagnosed acne was assessed across 5 BMI percentile categories and stratified by race/ethnicity and age group (Table I). The association of BMI and acne, adjusting for race/ethnicity and age group, was examined with log-binomial regression to estimate relative risk (RR) with 95% confidence intervals (CIs).

Among 128,953 adolescent girls (average age 14.0 ± 2.3 years), 18.4% were overweight (≥85th to <95th BMI percentile) and 15.8% were obese (≥95th BMI percentile). The overall proportion of individuals with acne was 17.1%. Acne burden was highest in the upper part of normal BMI but was lower in the overweight and obese ranges (Table I). Adjusting for race/ethnicity and age group (Fig 1), BMI in the lower part of normal was associated with significantly lower risk of diagnosed acne (fifth to 25th percentile: RR 0.77, 95% CI 0.73-0.81; 25th to 50th percentile: RR 0.90, 95% CI 0.87-0.93) compared with BMI in the upper part of normal (reference group). BMI above normal was also associated with significantly lower risk of diagnosed acne (RR 0.96, 95% CI 0.93-0.99 [overweight]; RR 0.83, 95% CI 0.80-0.86 [obese]).

Overweight and obese adolescent girls do not appear to have a higher proportion of acne, even adjusted for race/ethnicity and age, compared with girls in the upper part of normal BMI. Patients in the overweight and obese weight groups may have other health issues that take precedence over acne, or overweight and obese adolescents could have biological factors leading to decreased acne. Limitations include a reliance on acne diagnosis codes and a lack of assessment of puberty status, dietary factors, or acne severity. Although diet and hormonal changes may influence acne, obese and overweight girls in our study had lower rates of diagnosed acne than girls with a BMI in the upper part of the normal range. Future studies could examine the relationship of body weight and acne severity, and referral for dermatology care.

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REFERENCES

1. Berkey CS, Rockett HR, Willett WC, Colditz GA. Milk, dairy fat, dietary calcium, and weight gain: a longitudinal study of adolescents. *Arch Pediatr Adolesc Med*. 2005;159(6):543-550.
2. Melnik BC, John SM, Plewig G. Acne: risk indicator for increased body mass index and insulin resistance. *Acta Derm Venereol*. 2013;93(6):644-649.
3. Tsai MC, Chen W, Cheng YW, Wang CY, Chen GY, Hsu TJ. Higher body mass index is a significant risk factor for acne formation in schoolchildren. *Eur J Dermatol*. 2006;16(3):251-253.
4. Halvorsen JA, Vleugels RA, Bjertness E, Lien L. A population-based study of acne and body mass index in adolescents. *Arch Dermatol*. 2012;148(1):131-132.
5. Snast I, Dalal A, Twig G, et al. Acne and obesity: a nationwide study of 600,404 adolescents. *J Am Acad Dermatol*. 2019;81(3):723-729.

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Hair graying may occur early in life in tuberous sclerosis complex and is distinct from poliosis

To the Editor: The literature on hair pigmentary changes in tuberous sclerosis complex (TSC) focuses on poliosis, a white patch of hair that occurs in infancy in about 18% of cases.[1] In one instance, premature hair graying was described in a 15-year-old girl with TSC.[2] We sought to determine the frequency and clinical characteristics of hair pigmentary changes in individuals diagnosed with TSC.

Fig 1. Hair graying with onset at age 21 years in a 42-year-old woman.

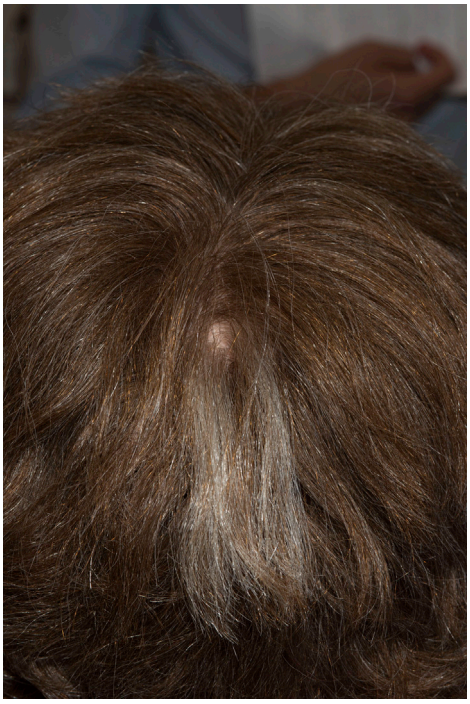

Fig 2. Poliosis with onset in infancy in a 53-year-old woman and hair graying that began in her 30s.

In this retrospective cohort study, adults with TSC at the National Institutes of Health Clinical Center underwent interviews and dermatologic examination regarding hair changes. The cohort was enriched for those with lymphangioleiomyomatosis, a TSC-related lung disease that primarily affects women. The medical records and photographs of patients evaluated between August 2018 and August 2019 were reviewed, with clarification of clinical histories by structured telephone calls and e-mails.

Of 26 patients, 23 were women; 20 identified as white, 3 as multiracial, 1 as black, 1 as Asian, and 1 was unknown. Twenty of 26 (77%) patients had lymphangioleiomyomatosis (LAM). The median age was 42 years (range, 21-74 years). Seven of 26 (27%) patients with TSC (6 white, 1 multiracial) reported onset of hair graying at 25 years or younger, at a median age of 21 years (range, 9-25 years). Of the 7 patients with TSC and early-onset hair graying, 5 had LAM, and LAM was not detected in 2. There was no history of potential confounders of premature hair graying,[3,4] except for 2 patients with hypothyroidism who were treated with levothyroxine. Reportedly, gray hairs were scattered and sparse at onset and slowly increased with age. On examination, gray hairs were either diffuse or scattered among mostly pigmented hairs in a symmetric distribution at the frontotemporal scalp (Fig 1). All patients with early-onset hair graying were female, and only 1 had a family history of premature hair graying in the patient's mother. Infancy- or childhood-onset poliosis was reported by 6 of 26 (23%; 5 white, 1 multiracial) patients, 4 of whom reported spontaneous repigmentation in adolescence or adulthood. On examination of 1 of these patients in adulthood, there was a hypopigmented circumscribed patch of scalp hair in addition to scattered gray hairs (Fig 2). Eighteen of 26 (69%) patients reported dying their hair, including 6 with early-onset hair graying and 5 who had poliosis.

Individuals with TSC may exhibit hair graying and/or poliosis. Hair graying may occur at or before 25 years of age, as observed in 27% of patients with TSC in this cohort. This may be more frequent than in the general population, because 37 of 293 postmenopausal women (12.6%) reported any hair graying before 30 years of age.[5] To clearly determine whether premature hair graying is more frequent in TSC requires a larger prospective study with age-, sex-, and race-matched control individuals. This type of analysis would overcome the limitations of our study, which include the small sample size and retrospective study design. In conclusion, hair graying in TSC is distinct from poliosis; it generally occurs later in childhood, is progressive, and presents as gray hairs interspersed among pigmented hairs

rather than sharply demarcated patches with decreased pigmentation.

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REFERENCES

1. McWilliam RC, Stephenson JB. Depigmented hair. The earliest sign of tuberous sclerosis. *Arch Dis Child*. 1978;53(12):961-963.
2. Kumar P, Brindha S, Manimegalai M, Premalatha S. Tuberous sclerosis with interesting features. *Indian J Dermatol Venereol Leprol*. 1996;62(2):122-124.
3. Thompson KG, Marchitto MC, Ly BCK, Chien AL. Evaluation of physiological, psychological, and lifestyle factors associated with premature hair graying. *Int J Trichology*. 2019;11(4):153-158.
4. Triwongwaranat D, Thuangtong R, Arunkajohnsak S. A review of the etiologies, clinical characteristics, and treatment of canities. *Int J Dermatol*. 2019;58(6):659-666.
5. Orr-Walker BJ, Evans MC, Ames RW, Clearwater JM, Reid IR. Premature hair graying and bone mineral density. *J Clin Endocrinol Metab*. 1997;82(11):3580-3583.

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Association between psoriasis and risk of dementia: A systematic review and meta-analysis

To the Editor: Psoriasis is a chronic inflammatory skin condition associated with psychiatric and neurologic disorders,[1] including dementia. Although the etiology of many dementias are poorly understood, neuroinflammation and vasculopathy are hypothesized to play a role. We conducted a systematic review and meta-analysis to better characterize the association between psoriasis and dementia.

We registered a protocol in PROSPERO (CRD42020166789). We searched MEDLINE and Embase on January 25, 2020, using key terms for dementia and psoriasis (the search strategy is provided in Supplemental Tables I and II; available via Mendeley at https://doi.org/10.17632/h5j8yrksch.2). We included cross-sectional, case-control, and cohort studies examining the incidence or prevalence of dementia among adults with psoriasis compared to adults without psoriasis. Case reports, abstracts, and review articles were excluded. Risk of bias in individual studies was assessed using the Newcastle-Ottawa scale.[2] Random-effects meta-analyses using pooled hazard ratios (HRs) were performed. The I^2 statistic was used to assess heterogeneity across studies. A funnel plot was used to evaluate potential publication bias. Analyses were conducted using Review Manager, version 5.3 (The Nordic Cochrane Centre, Copenhagen, Denmark).

A total of 8 articles met our eligibility criteria and were included in the qualitative synthesis (Supplemental Fig 1, available via Mendeley at https://doi.org/10.17632/h5j8yrksch.2; Table I, citations of included studies removed due to journal citation constraints and are available from the authors upon request). The mean ages of participants with psoriasis and control individuals were 59.7 and 47.9 years, respectively.

Four studies reported effect measures for the association between dementia and psoriasis and were included in quantitative analyses. Three studies