REVIEW

Relative versus absolute risk of comorbidities in patients with psoriasis

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Background: Psoriasis is associated with numerous comorbidities, often reported in terms of relative risk. Both doctors and the general population tend to overestimate the effects of exposures when presented in relative terms, leading to anxiety and potentially poor treatment decisions. Absolute risks might provide a better basis for risk assessment.

Objective: To characterize and compare relative and absolute risks of comorbidities in patients with psoriasis.

Methods: A systematic review using Medline identified comorbidities associated with psoriasis, their relative risks, and information for calculating absolute risks.

Results: The comorbidities associated with psoriasis with the highest relative risk were nonmelanoma skin cancer, melanoma, and lymphoma, with relative risks of 7.5, 6.12, and 3.61, respectively; the attributable risk for these 3 conditions were 0.64, 0.05, and 0.17 per 1000 person-years, respectively. To attribute 1 event of these conditions to psoriasis would require seeing 1551; 20,135; and 5823 patients, respectively.

Limitations: Database studies might not fully account for confounders, resulting in overestimates of the risk impact of comorbidities.

Conclusions: Presenting attributable risk in the form of the number needed to harm provides a clearer picture of the magnitude of risk and a basis for wiser medical decision making and patient education. (J Am Acad Dermatol http://dx.doi.org/10.1016/j.jaad.2016.11.037.)

Key words: attributed risk; excess risk; measurements; perception; systematic review.

Psoriasis is an immune disease that affects 2% of the population[1] and is associated with a higher risk for numerous other diseases involving nearly every organ system.[2,3] Associations can be presented on a relative or absolute basis. Absolute risk describes the incidence of a disease in a defined population; the attributed risk of an exposure is the difference in absolute risk between exposed and unexposed groups. In contrast, relative risk is a fractional comparison between an exposed and unexposed group. In other words, the relative risk is a measure of the strength of an association, while the attributed risk measures the magnitude of risk an exposure adds to the incidence. The attributed risk answers the question, "how much of the myocardial infarction risk can be attributed to

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Funding source: The Center for Dermatology Research is supported by an unrestricted educational grant from Galderma Laboratories, LP.

Conflict of interest: Dr Feldman is a speaker for Janssen and Taro. He has received research, speaking, and consulting support from a variety of companies including Galderma, GSK/Stiefel, Almirall, Leo Pharma, Baxter, Boehringer Ingelheim, Mylan, Celgene, Pfizer, Valeant, AbbVie, Cosmederm Bioscience Inc, Anacor Pharmaceuticals Inc, Astellas Pharma, Janssen Pharmaceutical, Eli Lilly and Company, Merck, Merz, Novartis, Qurient Therapeutics, National Biological Corporation, Caremark, Advance Medical, Suncare Research, Informa, UpToDate, and National Psoriasis Foundation. He is the founder and majority owner of www.DrScore.com. He is founder and part owner of Causa Research, a company dedicated to enhancing patients' adherence to treatment. Mohammed D. Saleem and Chelsea Kesty have no conflicts to disclose.

Accepted for publication November 13, 2016.
Reprints not available from the authors.

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Published online December 13, 2016.
0190-9622/$36.00

http://dx.doi.org/10.1016/j.jaad.2016.11.037

psoriasis?" The number needed to harm (NNH) is the inverse of the attributed risk; it is the number of events required to occur before one case could be attributed to the exposure.

Relative risk, which is usually reported when describing comorbidities of psoriasis, is a useful tool for summarizing evidence of an association.[4] Absolute measures—such as attributed risk, absolute risk, or number needed to harm—are better than relative risk for assessing clinical or public health implications of an association.[4] Although ideally both relative and absolute measurements should be given, often the measure most important for clinical and public health decisions is left out.

CAPSULE SUMMARY

- Comorbidities associated with psoriasis are often measured using relative risk.
- Comorbidities reported as relative risk can be deceptive, as relative risk overestimates the effect of exposure.
- Presenting risk as number needed to harm provides physicians with the tools to improve patient management and communication.

Both doctors and the general population tend to overestimate the effects of exposures when presented in relative terms, leading to anxiety and poor treatment decisions.[5,6] Describing risks in absolute terms provides a better basis for risk assessment and enhances communication in the patient-doctor relationship. The purpose of this review is to characterize and compare relative and absolute risks for comorbidities in patients with psoriasis to provide a foundation for a better understanding of the implications of psoriasis comorbidities on our patients' lives and on psoriasis treatment decision making.

METHODS

Methods for analysis and criteria for article selection were prepared to identify and evaluate prospective and retrospective cohort studies that linked psoriasis to other diseases. We included studies examining patients with psoriasis of any age but excluded those that were either sex or profession restricted or solely focused on psoriatic arthritis. Studies that reported a quantitative relative risk of a comorbidity (and not just surrogate markers, such as C-reactive protein) were included. All studies used were published within the last 10 years. Only studies available in English were eligible. No geographic exclusions were placed.

Studies were searched using Medline (2006-present); the last search was performed on June 21, 2016. The references of relevant studies or reviews that were identified during the search were included. The initial search used 3 medical subject heading terms: "psoriasis," "cohort studies," and "risk factors"; a more complex search was also conducted (Appendix). A PubMed strategy was developed to ensure that the most recent added studies were included, an alert was created and set to update once a week for the search queries. Studies that were not indexed in Medline were accounted for by performing an additional search, which was conducted with a filter for those added on or after May 1, 2016.

Titles and abstracts were examined for relevant articles. Of the selected studies, each was carefully assessed for quality and eligibility. The data from each article were extracted onto a pilot chart, which included study population, primary endpoint, confounders adjusted, reference incidence, and relative risk. Articles were individually assessed for quality and bias using the cohort studies Newcastle-Ottawa scale (NOS). NOS uses a 9-point scale; assessment includes selection of the study groups, comparability of the groups, and ascertainment of outcome of interest (Supplemental Table I). During the assessment, no assumptions about information was made. If the study did not include the information required for completion for the NOS scale, the study was not given a star for the criteria. For each of the studies, the primary endpoint, population, and confounders adjusted for were extracted (Table I). Relative risk and baseline incidence were recorded. Absolute risk, attributed risk, and number needed to harm (NNH) were calculated. In our discussion, the NNH was interpreted as the number of patients that are required before 1 event (comorbidity) is attributed to psoriasis.

RESULTS

Of 490 studies screened using titles and abstracts, 33 met initial inclusion criteria and were assessed in further detail; 10 were initially deemed eligible (Table I). All studies included in the review were cohort studies published within the last 10 years. In order of frequency, the cohorts used the following databases: Danish population database, Taiwan's National Health Insurance Research database, and the General Practice Research database (United Kingdom). None of the included studies involved an American population.

The comorbidities with the highest relative risk were nonmelanoma skin cancer (excluding