Estimated cost efficacy of systemic treatments that are approved by the US Food and Drug Administration for the treatment of moderate to severe psoriasis

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Background: Newer psoriasis treatments tout higher efficacy but are generally more expensive.

Objective: We sought to estimate the cost efficacy of systemic psoriasis treatments that have been approved by the US Food and Drug Administration (FDA).

Methods: A literature review of systemic psoriasis treatments that have been approved by the FDA was performed for the primary end point of a 75% reduction in the Psoriasis Area and Severity Index score (PASI 75). Medication cost was referenced by wholesale acquisition cost (WAC), laboratory fees were obtained from the American Medical Association, and office visit fees are standard at our university. Total expenses were standardized by calculating cost per month of treatment considering the number needed to treat (NNT) to achieve PASI 75.

Results: Methotrexate ($794.05-1502.51) and cyclosporine ($1410.14-1843.55) had the lowest monthly costs per NNT to achieve PASI 75. The most costly therapies were infliximab ($8704.68-15,235.52) and ustekinumab 90 mg ($12,505.26-14,256.75). Monthly costs per NNT to achieve PASI 75 for other therapies were as follows: narrowband ultraviolet B light phototherapy ($2924.73), adalimumab ($3974.61-7678.78), acitretin ($4137.71-14,148.53), ustekinumab 45 mg ($7177.89-7263.99), psoralen plus ultraviolet A light phototherapy ($7499.46-8834.98), and etanercept ($8284.71-10,674.89).

Limitations: Drug rebates and incentives, potential adverse effects, comorbidity risk reduction, ambassador programs, and combination therapies were excluded.

Conclusion: Our study provides meaningful cost efficacy data that may influence psoriasis treatment selection. (J Am Acad Dermatol 2015;72:589-98.)

Key words: biologics; cost effectiveness; methotrexate; phototherapy; psoriasis; psoriasis treatment.

Recent advances in biologic agents have considerably expanded the treatment armamentarium for patients with psoriasis. In the coming years, these therapeutic options will increase as innovator molecules and even biosimilars enter the market. While the manufacturers of some biologics claim that the drugs offer higher efficacy and potentially more acceptable side effect profiles, their price is generally higher than traditional systemic medications and phototherapy. Given the chronicity of psoriasis, these expenses compound

Abbreviations used:

DLQI:	Dermatology Life Quality Index
FDA:	US Food and Drug Administration
NBUVB:	narrowband ultraviolet B light phototherapy
NNT:	number needed to treat
PASI 75:	75% reduction in Psoriasis Area and Severity Index score
PUVA:	psoralen plus ultraviolet A light phototherapy
WAC:	wholesale acquisition cost

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over the duration of treatment. Rising health care costs are already creating a significant financial burden for our society; we must strive to deliver health care in a fiscally responsible manner.

There have been several recent studies evaluating the cost efficacy of systemic medications in the treatment of psoriasis, but they do not include all systemic treatments approved by the US Food and Drug Administration (FDA) because of overly stringent inclusion criteria or because the studies extrapolate results beyond studied intervals for all approved therapies.[1,2] In this study, we calculate the cost efficacy of all systemic medications that are currently approved by the FDA for the treatment of moderate to severe psoriasis. Using a broad literature review of systemic psoriasis treatments that have been approved by the FDA, each individual therapy is standardized by estimated cost per number needed to treat (NNT) to achieve a 75% reduction in the Psoriasis Area and Severity Index score (PASI 75). Consequently, the goal of our analysis is to aid clinicians and patients in choosing between potential treatments by providing meaningful cost efficacy data that can be considered one of the many factors that ultimately lead to treatment selection.

CAPSULE SUMMARY

- Newer psoriasis treatments tout higher efficacy but are generally more expensive.
- The most costly therapies for number needed to treat to achieve a 75% reduction in the Psoriasis Area and Severity Index score were infliximab ($8704.68-15,235.52) and ustekinumab 90 mg ($12,505.26-14,256.75).
- Cost efficacy should be an important factor that helps dictate treatment selection.

METHODS

A literature review of PubMed was performed regarding the efficacy of all systemic medications that are currently approved by the FDA for the treatment of psoriasis (ie, narrowband ultraviolet B light phototherapy [NBUVB], psoralen plus ultraviolet A light phototherapy [PUVA], acitretin, methotrexate, cyclosporine, etanercept, adalimumab, infliximab, and ustekinumab) with the search terms "psoriasis" and "PASI 75" published between 1991 and 2013. Preference for inclusion was given to randomized controlled trials, when available, of a systemic psoriasis treatment as monotherapy compared to a placebo group. Articles not published in English were excluded from this study, as were data that were reported in multiple publications. Based on our literature review, we used reported PASI 75 (ie, the percentage of patients that improve by 75% compared to baseline, determined by the body surface area affected and the severity of cutaneous psoriasis lesions measured from 0 [no disease] to 72 [maximum disease]) scores as the criterion standard of measuring efficacy over a duration of treatment listed as the primary end point of each study. If multiple studies met our search criteria, the range of efficacies and doses of medications were included for analysis. The NNT to achieve PASI 75 was then calculated for each treatment (ie, 1/[% achieving PASI 75]).

The financial costs associated with treatment are multifactorial. Medication cost was referenced by the wholesale acquisition cost (WAC), which is the list price for a drug product to wholesalers without inclusion of discounts, rebates, reductions, or other factors affecting price. Weight-based medications were based on a 90-kg (~200-lb) patient. Infusion costs for infliximab assumed a 3-hour infusion time. Laboratory test prices were standard fees based on the 2014 American Medical Association's clinical diagnostic laboratory fee schedule, and their frequency was based on the routine clinical practice at our institution. Billing codes and frequency of follow-up were also based on our practice norms. Total cost was then calculated by multiplying the cost over each study's treatment period by the NNT to achieve PASI 75. In order to adequately adjust expenses for comparison over each study's varying duration of treatment, total costs were then standardized to a single month.

RESULTS

Twenty-six studies encompassing 39 treatment regimens (7099 patients) met our search criteria (Table I). The medication, office visit, and laboratory costs per treatment period for each of the 39 studies are shown in Table II. Methotrexate, cyclosporine, and acitretin generally require more frequent office visits than phototherapy and biologic medications. While baseline laboratory costs are generally similar across all the medications except for phototherapy, monitoring laboratory costs are higher for methotrexate, cyclosporine, and acitretin compared to the other medications. Finally, the total medication costs per treatment period, the medication costs per PASI 75, and a ranking of the unadjusted and adjusted monthly medication costs per PASI 75 are shown in Table III. In order to appreciate the variability across