Research gaps in psoriasis: Opportunities for future studies

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Over the past 2 decades, considerable progress has been made to further elucidate the complex pathogenesis of psoriasis, facilitating the development of a new armamentarium of more effective, targeted therapies. Despite these important advances, substantial deficits remain in our understanding of psoriasis and its treatment, necessitating further research in many areas. In the sixth section of the American Academy of Dermatology Psoriasis Guidelines of Care, gaps in research and care were identified. We discuss the most important gaps in research that currently exist and make suggestions for studies that should be performed to address these deficits. These encompass both basic science and clinical research studies, including large, prospective epidemiologic studies to determine the true prevalence and natural history of psoriasis; further molecular studies in patients with psoriatic and psoriatic arthritis to understand the function of psoriasis susceptibility genes and to identify novel therapeutic targets; studies to examine the role of environmental factors in the development of psoriasis; further investigation of the relationship between psoriasis and cardiometabolic disease; studies that examine the role of adjunctive therapies such as psychological interventions in appropriate patient groups; and finally, studies to identify biomarkers of disease severity and treatment response to optimize patient therapy. (J Am Acad Dermatol 2014;70:146-67.)

Key words: adjunctive therapies; biologics; cardiovascular disease; comorbidities in psoriasis; comparative studies; disease severity; environmental factors in the development of psoriasis; future research studies; methotrexate; molecular studies in psoriatic and psoriatic arthritis; pathomechanisms and genetics of psoriasis; phototherapy; psoriasis; psoriasis guidelines; psoriasis treatment; psoriatic arthritis; psychological; research gaps; therapeutic targets; topical therapies.

Although tremendous progress has been made in recent years regarding our understanding of the pathogenesis and treatment of psoriasis, there are still significant gaps in our knowledge base. In this article, we will address some of the more prominent and important gaps in research that currently exist and make suggestions for studies that should be performed to address these gaps.

Significant advances have been made in unraveling the complex genetic basis of psoriasis and in identifying inflammatory pathways important in disease pathogenesis. This has facilitated the development of several new, more selective biologic

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Abbreviations used:

ACR:	American College of Rheumatology
CRP:	C-reactive protein
FDA:	Food and Drug Administration
IFN:	interferon
IL:	interleukin
MACE:	major adverse cardiovascular events
MI:	myocardial infarction
NB:	narrowband
NIH:	National Institutes of Health
PsA:	psoriatic arthritis
RA:	rheumatoid arthritis
RCT:	randomized controlled clinical trial
TNF:	tumor necrosis factor
UV:	ultraviolet
VEGF:	vascular endothelial growth factor

agents, many of which are in clinical development. Further understanding of the immunopathogenesis of psoriasis and psoriatic arthritis (PsA) may allow the identification of more efficacious, highly targeted therapies. In an era of rapidly advancing molecular technology, the functional relevance of all currently known psoriasis susceptibility genes needs to be fully elucidated, particularly for different disease phenotypes. Further research is needed to examine the natural history of psoriasis and factors that determine disease prognosis. The wide spectrum of comorbidities observed in patients with psoriasis is ever-growing. Patients with psoriasis have an increased prevalence of cardiovascular disease, diabetes, hypertension, hyperlipidemia, obesity, inflammatory bowel disease, obstructive sleep apnea, steato-hepatitis, and psychiatric disorders. The mechanistic pathways leading to these comorbid conditions need to be fully elucidated. Further research and interventions to adequately screen for and treat the psychological and cardiovascular comorbidities associated with psoriasis are also warranted.

METHODS

A work group of 12 recognized psoriasis experts was convened to produce the American Academy of Dermatology Psoriasis Guidelines of Care.[1-6] The sixth and final section of these guidelines listed several current gaps in psoriasis research and care. This review further expands on these deficiencies in our knowledge base and makes suggestions for further studies to address these research gaps. A search of the MEDLINE database spanning from inception to March 2013 was performed to ensure adequate studies had not been done in each of the proposed research areas. Only English-language publications were reviewed. Once a review of current research gaps was formulated, each expert gave their critical appraisal of the evidence presented. All work group members completed a disclosure of commercial support.

Clinical features

The global incidence and prevalence of psoriasis has not been comprehensively studied (Table I). A recent systematic review of published population-based studies examined the prevalence and incidence of psoriasis worldwide.[7] The prevalence varied from 0.91% in the United States to 8.5% in Norway, with higher frequencies observed in countries of higher latitude. Further research is needed to examine trends in incidence over time and the prevalence of psoriasis-associated comorbidities according to age and geographic region.

There have been no large, broadly representative, prospective, longitudinal studies specifically designed to evaluate the natural history of psoriasis. Our knowledge of the natural history of psoriasis is largely derived from large cross-sectional studies, the psoralen plus ultraviolet (UV) A cohort study, and analyses of data from administrative and medical record databases.[8-10] The largest cross-sectional study of psoriasis in the United States, performed over 35 years ago, suggested that spontaneous remission may occur in up to one third of patients.[9] Studies are needed to validate this frequency and characterize factors associated with spontaneous remission for different phenotypes of psoriasis, including disease severity, age, morphologic attributes of plaques, and patient comorbidities. Comprehensive profiling of patients who experience spontaneous remission of psoriasis may yield insight into factors that determine chronicity of the disease. Small studies have also shown that classifying patients with chronic plaque psoriasis into those with thin or thick plaques may have implications for the clinical course of disease.[11]

The Centers for Disease Control and Prevention recently issued recommendations for a public health research agenda addressing the need for further public health research in psoriasis and PsA, which should increase awareness and understanding of psoriasis and its associated comorbidities from a public health perspective.[10] Expert consultants identified and discussed key issues pertinent to the development of a public health agenda and reviewed the existing peer-reviewed, public health literature to inform knowledge gaps for each key issue (Table II).[10]

Pathomechanisms of disease

Major advances in immunologic and genetic research have resulted in considerable progress in