

REVIEW

National Psoriasis Foundation clinical consensus on psoriasis comorbidities and recommendations for screening

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There have been several articles and reports in recent months about comorbidities and risks that affect psoriasis patients in addition to their underlying disease. This piece reviews the current literature and begins to address what should be done with this new information by updating the clinician about what health screening tests, preventative exams, and referrals should be considered in this population. (J Am Acad Dermatol 10.1016/j.jaad.2008.01.006.)

Beyond a debilitating skin ailment often associated with a large negative impact on health-related quality of life, psoriasis is now clearly linked with a number of behavioral and systemic comorbidities in many patients. In addition, the

dermatologist may be the only healthcare specialist seen, and one study suggests that patients seen in a dermatology clinic have unmet preventive health care needs.¹ What follows is a primer for dermatologists regarding the data supporting psoriasis as a

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significant indicator of comorbidity and an initial guide to the kinds of care this group of patients may need. In some cases, dermatologists may want to begin to evaluate and treat patients for these associated medical issues; in others, referral to a primary care physician or specialist may be more appropriate.

Specifically, people with more severe presentations of psoriasis appear to have an increased frequency of psoriatic arthritis, cardiovascular disease (CVD), hypertension, obesity, and diabetes; other immune-related ailments, such as Crohn's disease; and an excess risk of mortality.² Further, psoriasis patients often suffer from depression, and more frequently smoke and drink alcohol to excess, which may negatively compound the health status of these patients. Evolving research suggests that the chronic inflammatory nature of psoriasis itself may lead to adverse health outcomes, including coronary artery disease and myocardial infarction (MI).^{3,4} Given the increased prevalence of comorbidities in patients with psoriasis, dermatologists who treat psoriasis—especially more severely affected patients—need to approach the disease as a potentially multisystem disorder. At the very least, dermatologists—who may be the only health care provider for psoriasis patients—must alert these patients to the potentially negative effects of their disease as it relates to other aspects of their health.

GENERAL CARDIOVASCULAR RISK

Studies dating back several decades of patients hospitalized for psoriasis or from tertiary care referral clinics have shown that psoriasis is associated with increased occlusive vascular disease, including cardiovascular risk (CVR).^{5,6} In initial assessments, the increased risk of MI and vaso-occlusive disease was attributed to the increased prevalence of risk factors. These risk factors have been attributed to behaviors such as obesity and smoking which are thought to be provoked by the psychosocial burden of the disease.⁷⁻¹² However, more recent studies have advanced our understanding of CVR in psoriasis. Specifically, a large population-based study demonstrated an increased risk of MI in patients with psoriasis (particularly those with severe disease) even when accounting for major CVR factors, such as obesity, smoking, diabetes, and hypertension.^{4,13} Similarly, a small study of a well-defined population of patients with very severe psoriasis demonstrated that these patients had a higher frequency of coronary artery disease compared to controls, even when controlling for known risk factors for atherosclerosis.³ Taken together, these studies suggest that psoriasis itself may be a risk factor for developing atherosclerosis and MI. These findings are consistent

with the known contribution chronic inflammation has for the development of atherosclerosis and MI as well as similar studies in patients with rheumatoid arthritis, which have yielded the same conclusions. A population-based study showed an increased risk of mortality in patients with severe psoriasis.² Interestingly, the one prospective cohort study examining this question in a group of patients exposed to psoralen plus ultraviolet A light phototherapy (PUVA) was not able to detect an effect on mortality, using age- and sex-matched US mortality rates.¹⁴ The relationship between systemic treatment of psoriasis and CVR factors has not been adequately studied; however, in rheumatoid arthritis and psoriasis, systemic treatment with methotrexate has been shown to decrease vascular risk.¹⁵

These developments have made it increasingly challenging to counsel patients who previously regarded themselves as primarily having a skin disease and, in many cases, have depended on their dermatologist to serve as both their skin expert and primary care provider. Thus we have reviewed both the comorbidities that have been identified and the recommended screening guidelines. Psoriasis patients have been identified as having a higher frequency of hyperlipidemia, depression, hypertension, insulin resistance and diabetes mellitus, and homocysteinemia.^{13,16-22} Behavioral risk factors, including obesity and smoking, will be discussed in the following section.

Recommendations

The 2002 American Heart Association (AHA) update incorporates guidelines and statements that have been developed by multiple health care organizations, including the Agency for Healthcare Policy and Research, the National Heart, Lung, and Blood Institute, and the US Preventive Services Task Force.²³ Current recommendations include risk factor screening as early as age 20. By age 40, the screening shown in [Table I](#) is recommended. Smoking cessation, moderating alcohol intake, and exercising 3 times a week for 30 minutes or more are additional recommendations. It should be noted that these recommendations are for individuals who are not already known to have a risk factor. These guidelines have been modified with more intensive cholesterol monitoring for people with additional risk factors.²⁴ Individuals with diabetes, a family history of premature coronary heart disease, or other risk factors may need to be followed more closely.

METABOLIC SYNDROME

Metabolic syndrome has received an increased focus in the field of psoriasis.²⁵ A hospital-based case

Table I. American Heart Association recommendations for risk factor screening

Measurement	Recommendation
Blood pressure	Evaluated at least every 2 yrs; target <120/80 mm Hg
Body mass index	Evaluated at least every 2 yrs; target <25 kg/m ²
Waist circumference	Evaluated at least every 2 yrs; target: <35 in for women <40 in for men
Pulse	Evaluated at least every 2 yrs
Fasting serum lipoprotein or total and HDL cholesterol	Evaluated at least every 5 yrs or every 2 yrs if risk factors, such as a positive family history, presence of diabetes, or smoking habits are present; Total cholesterol = <200 mg/dL HDL = ≥ 50 mg/dL LDL optimal: <100 mg/dL Near optimal/above optimal: 100-129 mg/dL Borderline high: 130-159 mg/dL High: 160-189 mg/dL Very high: ≥ 190 mg/dL
Fasting blood glucose	Evaluated at least every 5 yrs or every 2 yrs if risk factors are present; target <100 mg/dL

HDL, High-density lipoprotein; LDL, low-density lipoprotein.

Table II. Components of metabolic syndrome

Criteria	Measurement
Elevated waist circumference	Men: ≥ 40 in (102 cm) Women: ≥ 35 in (88 cm)
Elevated triglycerides	≥ 150 mg/dL
Reduced HDL ("good") cholesterol	Men: <40 mg/dL Women: <50 mg/dL
Elevated blood pressure	≥ 130/85 mm Hg
Elevated fasting glucose	≥ 100 mg/dL

HDL, High-density lipoprotein.

control study has shown an increased prevalence of metabolic syndrome in psoriasis patients that is independent of psoriasis severity.²⁶ Metabolic syndrome is a combination of metabolic risk factors in an individual, including abdominal obesity, atherogenic dyslipidemia, elevated blood pressure, insulin resistance or glucose intolerance, prothrombotic state, and a proinflammatory state. While there are no well accepted criteria for defining metabolic syndrome, the American Heart Association and the National Heart, Lung, and Blood Institute recommend that metabolic syndrome be identified by 3 or more of the components shown in Table II.²⁷

Recommendations

The primary goal of treating metabolic syndrome is to reduce CVD. The AHA recommends lifestyle modifications as a first-line therapy for metabolic syndrome. These recommendations include weight loss to achieve a body mass index (BMI) of less than

25 kg/m², increased physical activity with 30 minutes of moderate-intensity activity most days of the week, and healthy eating habits.²⁸

BEHAVIORAL-DRIVEN RISK CARDIOVASCULAR RISK

The increased risk for CVD in psoriasis patients may also be mediated through behaviorally driven CVR factors, such as smoking, obesity, and depression.

Smoking

In 2004, the prevalence of smoking among US adults was 20.9%,²⁹ while in the United Kingdom it was 28% for men and 26% for women.³⁰ Smoking has well-known links to hypertension, peripheral vascular disease, stroke, and MI.³¹ An increased prevalence of smoking among psoriasis patients has been noted in Finland,³² Italy,^{10,33} the United Kingdom,^{13,34} Norway,³⁵ China,¹² and the United States.⁹ In the Utah Psoriasis Initiative (UPI) database (>800 subjects) it was found that 37% ($P < .001$) of psoriatics smoke versus 13% of the general population. Most (78%) started smoking before versus 22% starting after the onset of psoriasis.⁹ The Italian study identified smoking as a risk factor for developing psoriasis. In the Nurses Health Study II, past and current smoking was associated with psoriasis development in women.³⁶ Smoking has also been strongly associated with pustular psoriasis.³³ The increased prevalence of smoking seen in patients with psoriasis could contribute to an elevation in CVR in patients with psoriasis.

Obesity

Obesity has become an epidemic within the United States. A BMI greater than or equal to 30 is obese; a BMI between 25 and 29.9 is considered overweight. In the United States, approximately 65% of people over 20 years of age are either overweight or obese.³⁷ This has also extended into Europe and beyond.³⁸ Obesity has serious health consequences, including hypertension, vascular disease, and type II diabetes mellitus.³⁷ Psoriasis is associated with increased weight. The mean weight of patients with psoriasis entering clinical trials is frequently more than 90 kg.^{39,40} Psoriasis was first associated with obesity in several large, epidemiologic studies from Europe.^{33,41,42} Recently, a database from the United Kingdom has shown elevated BMI in psoriasis patients. BMI is higher in severe psoriasis than in mild psoriasis.¹³

Studies from the United States show a less dramatic but still elevated BMI.⁴³ These analyses of BMI compared subjects with and without psoriasis while controlling for age, sex, and race. While there is no apparent reason for the prevalence of obesity, there was a trend toward greater BMI in psoriatics.⁴³ Analysis of data from the UPI cohort in Utah revealed that subjects had significantly higher BMI compared to controls in the general Utah population. They also had higher BMI than patients enrolled in the National Psoriasis Foundation, despite the fact that the rates of obesity in the general population in Utah are lower than those in the US population.⁹ BMI has also been shown to be a risk factor for psoriasis in an Italian study.³³ In the Nurses Health Study II, increased adiposity and weight gain were shown to be strong risk factors for the development of psoriasis in women.⁴⁴ An association between psoriasis and elevated BMI may be yet another factor which predisposes individuals with psoriasis to CVD. The relationship between weight loss and psoriasis severity remains to be elucidated, but several case studies have shown that weight loss from gastric bypass surgery results in remission of psoriasis.^{45,46}

Depression

Depression is associated with an increased risk of CVD.^{47,48} Psoriasis is associated with a lack of self-esteem and increased prevalence of mood disorders, including depression.^{49,50} The prevalence of depression in patients with psoriasis is about 24%.⁵¹ Treatments for psoriasis may affect depression. A recent study revealed that psoriasis subjects treated with etanercept had a significant decrease in Hamilton Rating Scale for Depression compared to controls; this observation is confounded because the presence of clinically diagnosed depression was an

exclusionary criteria for this study.⁵² It seems that this treatment lessened symptoms of depression in those without overt depression. Increased rates of depression in patients with psoriasis may be another factor leading to increased risk of CVD. A recent editorial summarizes the data on how treating depression affects the risk of CVD, and concludes that while there is suggestive evidence that selective serotonin reuptake inhibitors reduce cardiac events, firm evidence for this has not been established.⁵³

Recommendations

New information suggests a complex interplay of psoriasis and its comorbidities, including CVD, obesity, and depression. The controlled study of risk factor modification, including smoking cessation, weight loss, and treatment of depression and its impact on CVD, is warranted in psoriasis subjects.

Until such data are available, it is apparent that smoking cessation, altering lifestyle to move to an ideal BMI, exercising 3 times a week for 30 minutes, monitoring and modifying cholesterol levels to be within recommended ranges, and taking measures to control depression have the potential to at least partially offset the increased risk inherent to the cutaneous component of psoriasis. There are multiple brief screening tests for depression, but the US Preventative Services Task Force also notes that "...simply asking questions about depressed mood and anhedonia appear[s] to detect a majority of depressed patients and, in some cases, perform better than the original instrument from which they were derived."⁵⁴ There are several medications approved by the US Food and Drug Administration that may aid in smoking cessation, weight loss, and the treatment of depression, as well as established behavioral interventions. Initiation of therapy or referral to the appropriate specialist may be indicated in some patients. The impact of treating psoriasis aggressively on these comorbidities is unclear, as is the ultimate effect on mortality. These effects may also depend on the type of treatment, but is an area of increasing research interest both in psoriasis and in related fields.⁵⁵

ALCOHOL INTAKE

While alcohol consumption has not been identified as a marker for increased CVR per se, it is a behavioral-driven factor which has, with some controversy, been linked to the onset of psoriasis, increased psoriasis severity, and decreased response to treatment. Less well-studied are the end results of alcohol-related comorbidities, such as cirrhosis and hepatocellular carcinoma. Multiple studies have shown that increased alcohol use, and in some cases,

abuse, are independent risk factors for psoriasis.^{56,57} A positive dose-response relationship between alcohol intake and psoriasis severity in women was seen in one prospective questionnaire-based study.³² Another prospective study showed less treatment-induced improvement in men who had higher pretreatment daily average alcohol consumption.⁵⁸ Lastly, higher mortality secondary to alcohol-related disease was seen in patients admitted to the hospital for moderate to severe psoriasis.⁵⁹ One study has shown higher rates of deaths from cirrhosis in psoriatics who drank at least moderately and had not been exposed to methotrexate.¹⁴ However, others have demonstrated a lack of statistical significance,⁶⁰ especially after controlling for confounders such as smoking.^{7,10} Moreover, most of these studies prove only an association between alcohol use and psoriasis, without demonstrating causality,^{12,61,62} and it has also been argued that other patients with severe skin disease may experience the same problems.⁶¹

Recommendations

Moderating the ingestion of alcohol may have multiple beneficial effects for patients. Behavioral therapy, support groups, and in some cases, medications may be helpful. Referral to an appropriate health care provider may be indicated.

INFECTION

Good data on the risk of both cutaneous and systemic infection in patients with psoriasis are very limited. Moreover, the few available reports give contrasting answers. In patients with erythrodermic psoriasis, there seems to be a significant risk of staphylococcal septicemia.^{63,64} However, while psoriatic patients have similar abnormalities in cutaneous barrier function to patients with atopic dermatitis, they have far fewer cutaneous infections.⁶⁵ This finding has been related to a cytokine profile in psoriatic plaques that up-regulates anti-bacterial proteins in keratinocytes.⁶⁶ One series from Germany suggests that the rate of cutaneous infection in psoriatics is diminished when compared to a control population.⁴² This may not be the case, however, for infections of the respiratory tract. A large population-based study in Sweden suggests that both males and females with psoriasis are at increased risk for pneumonia and systemic viral infections.⁴¹

One potential method for determining the risk of infection in patients with psoriasis is to investigate whether there is an increased risk of postoperative infections. There have been a number of case series, primarily from the orthopedic surgery literature, that

are limited by small numbers, retrospective methodology, and inconsistent results and thus limit the conclusions reached. An early survey of surgical procedures suggested no increase in infectious risk.⁶⁷ Retrospective reviews of knee arthroplasty⁶⁸ and foot and ankle surgery⁶⁹ both claim a low rate of infection from these procedures. However, these studies are in marked contrast to other series that report a significantly elevated rate of infection in surgical procedures performed on psoriasis patients. One report of 55 arthroplasties suggested that psoriasis patients were at a significantly increased risk for postoperative infection compared with patients with rheumatoid arthritis or osteoarthritis.⁷⁰ Similar findings have also been reported with knee arthroplasty.⁷¹ Finally, the largest published case-control study available suggests that psoriasis is a risk factor for postoperative infection in hip replacement surgery but not knee replacement surgery.⁷²

Recommendations

Limited and conflicting data obfuscate our understanding of possible infectious risk in patients with psoriasis. There is no substantial evidence that additional precautions need to be taken for plaque psoriasis patients in consideration of infectious risk. While the preponderance of data suggests that psoriasis may be a risk factor for postoperative infection in orthopedic surgery, most authors agree this condition does not preclude necessary procedures. Some surgeons prefer to try to clear the psoriatic skin before surgery, but no study has been performed to determine whether wound healing in psoriasis plaques is impaired. One study showed that dermatologists generally believe that surgery can be performed on psoriatic skin with minimal reservations.⁷³

One other concern in patients with psoriasis is vaccination. Issues include potential illness or lack of response to vaccination in patients who suffer from psoriasis as well as possible worsening of psoriasis after treatment with a vaccine. There is very limited literature in these areas. Two studies have compared the vaccine response of a neoantigen (phi-x-174) in patients on biologic therapy to control patients.^{74,75} In the placebo control subjects, response to this antigen was similar to that expected in healthy individuals. This response, however, was diminished with CTLA-4Ig and efalizumab treatment, while alefacept treatment seemed to have no significant effect. There have been sporadic reports of flare of psoriasis with vaccination, but these are quite limited. Therefore, we would suggest that the patient with psoriasis should be immunized according to the accepted schedules outlined by the US Centers for

Disease Control and Prevention. Some immunosuppressive therapies carry contraindications to live vaccines, and precautions should be taken when vaccinating individuals on immunosuppressive therapy. The vaccination of patients on immunosuppressive therapy has been discussed in detail by the Medical Board of the National Psoriasis Foundation.⁷⁶

MALIGNANCIES

Because the pathogenesis of psoriasis has a strong immunologic basis,⁷⁷ some have raised the concern that psoriasis could be associated with an increased risk of lymphoma. While some studies suggest an increased risk of lymphoma in patients with psoriasis,⁷⁸⁻⁸⁶ other studies do not support this association.⁸⁷⁻⁹⁷ The largest study evaluating this association is a retrospective, population-based cohort study that enrolled 153,197 patients with psoriasis and 765,950 matched patients without psoriasis.⁹⁸ Patients were identified through the United Kingdom General Practice Research Database, and analyses were age, gender and person-time adjusted. Psoriasis was associated with an increased risk of lymphoma, and the risk was strongest for Hodgkin's lymphoma (relative risk [RR], 1.48; 95% confidence interval [CI], 1.05-2.08) and cutaneous T-cell lymphoma (CTCL; RR, 4.34; 95% CI, 2.89-6.52). Increasing severity of disease predicted increased risk. These findings are consistent with previous studies designed to specifically examine the risk of Hodgkin's lymphoma and CTCL in psoriasis.^{80,81,85} Additionally, treatment of psoriasis patients with cyclosporine and methotrexate has been associated with the development of lymphoma.⁹⁹⁻¹⁰¹ There is also concern that the biologic therapies used to treat psoriasis, which selectively target specific components of the immune system, might increase the risk of lymphoma in these patients.

The increased risk of cutaneous squamous cell carcinoma (SCC) in psoriasis patients has been reported in several studies.^{78,87,102,103} An increased risk of SCC has been convincingly demonstrated for psoriasis patients treated with PUVA.^{80,103-105} Treatment with either coal tar or cyclosporine also increases the risk of SCC development.^{80,106,107} Although numerous studies have failed to demonstrate an increased risk of melanoma among PUVA-treated psoriasis patients,^{80,83,87,91} one group found an increased risk of melanoma among psoriasis patients treated with aggressive PUVA after 15 years of follow-up.^{108,109}

Several studies suggest an increased risk of solid malignancies in patients with psoriasis, including oral cavity, esophagus, pharynx, larynx, esophagus,

liver, pancreas, lung, bladder, kidney, breast, and colon cancer in women, and cancer of the genital organs, excluding the prostate, in men.^{79,80,83,88,91}

These data are limited by several issues, including sample size, target population, study design, duration of follow-up, and surveillance bias. Confounding factors, including concurrent carcinogenic therapies, tobacco smoking, and alcohol drinking, influence these findings, because both smoking and alcohol are risk factors for developing malignancies of the oral cavity, esophagus, liver, pancreas, lung (smoking only), kidney (tobacco only), and breast (alcohol only).

Determining baseline rates of cancer in patients with psoriasis is increasingly important, because immune-targeted biologic therapies are being used more commonly. Large population-based studies with long-term follow-up are best suited to assess risk, and more of these studies are necessary to better elucidate the relationship between psoriasis and malignancy. The strongest association exists between psoriasis and CTCL, which may be related to a misdiagnosis of CTCL as psoriasis or caused by the chronic lymphoproliferation found in psoriasis leading to CTCL in some patients. If there is an increased risk of developing different types of malignancies in psoriasis, a unifying hypothesis might be an alteration in cell proliferation and cell cycle control mechanisms beyond the epidermis, the structural element of skin housing the manifestations of disease.⁸⁰

Recommendations

Both dermatologists and their psoriasis patients should be vigilant for signs and symptoms of lymphoma, cutaneous malignancies, and other solid tumors. The development of atypical psoriasis plaques in the groin or buttock areas should raise suspicion for CTCL, and these patients should have complete lymph node examination and skin biopsy. All patients with elevated risk factors should be routinely screened for melanoma and nonmelanoma skin cancer. Psoriasis patients who have been exposed to PUVA, cyclosporine, methotrexate, or other immunosuppressive therapies should undergo complete annual skin examinations and be instructed to report any suspicious lesions. In addition, patients should report any signs or symptoms suggestive of new malignancy including unexplained weight loss, fatigue, swollen lymph nodes, or new growths, and should undergo regular, age-appropriate screening for malignancy. The American Cancer Society recommends age-appropriate screenings for breast cancer, colon and rectal cancer, and prostate cancer (Table III).¹¹⁰ Dermatologists should

Table III. American Cancer Society cancer screening recommendations

Cancer	Screening recommendation
Cancer-related checkup	20 yrs of age and older; should include health counseling and may include exams for cancers of the thyroid, oral cavity, skin, lymph nodes, testes, and ovaries
Breast cancer	Women 20-39 yrs of age Clinical breast exam (CBE) every 3 years Women \geq 40 yrs of age CBE annually Mammograms annually
Colon and rectal cancer	Men and women \geq 50 yrs of age Fecal occult blood test (FOBT) or fecal immunochemical test (FIT) annually Flexible sigmoidoscopy every 5 yrs FOBT or FIT yearly, plus flexible sigmoidoscopy every 5 yrs (preferred over either option alone) Double-contrast barium enema every 5 yrs Colonoscopy every 10 yrs
Prostate cancer	Men \geq 50 yrs of age Prostate specific antigen blood test annually Digital rectal exam annually

document in their records that another provider is performing these tests. Patients should be educated regarding avoidance or control of high-risk behavior, including smoking, excessive alcohol intake, and sun exposure, all of which are known risk factors for developing several types of malignancy.

PSORIATIC ARTHRITIS

Psoriatic arthritis (PsA) is an inflammatory arthritis associated with psoriasis, usually seronegative for rheumatoid factor.¹¹¹ PsA occurs in about 6% to 40% of patients with psoriasis, depending on the population studied. PsA prevalence has been reported to vary with the severity of psoriasis.¹¹² It affects men and women equally, at an average age of 36 years, between 7 to 10 years after the onset of psoriasis. A clinical feature which distinguishes patients with PsA from patients with uncomplicated psoriasis is nail lesions.¹¹³ Although initially thought to be predominantly mild, the arthritis has been found to have the potential to be progressive, severe, deforming, and destructive in more recent investigations. Patients with severe PsA are at increased risk of death.¹¹⁴ Although survival of patients with PsA has improved in the past 2 decades, the mortality risk remains.¹¹⁵ While the causes of death are similar to those of the general population, predictors for mortality include erosive disease at presentation and an elevated sedimentation rate.¹¹⁶

CVD is among the leading causes of death among patients with PsA.¹¹⁴ Recent evidence suggests that patients with PsA are at an increased risk for developing CVD.¹¹⁷⁻¹¹⁹ A study from the integrated outcomes database identified 3066 patients with PsA

which were matched 1:4 with individuals in the database on the basis of age, sex, location, and length in the plan. The prevalence ratios of peripheral vascular disease (1.6), congestive heart failure (1.5), atherosclerosis (1.4), ischemic heart disease (1.3), cerebrovascular disease (1.3), and hypertension (1.3) were higher in patients than controls. Similar observations were noted at the University of Toronto Cohort. In addition, risk factors for coronary artery disease, such as hypertension, diabetes, and hyperlipidemia, also had higher risk ratios (1.3, 1.5, and 1.2, respectively) among patients with PsA.¹¹⁹ Similar observations were made in a PsA cohort.¹²⁰ Patients with PsA exhibited greater intimal medial thickness, a measure of subclinical atherosclerosis, than healthy controls.¹¹⁸ Increased intimal medial thickness independently correlated with parameters of disease activity and conventional risk factors of atherosclerosis, including hypertension and hyperlipidemia. However, patients with PsA without evidence of CVD did not exhibit silent subclinical echocardiographic changes.¹²¹ A recent study found that patients with PsA do not demonstrate an increased cancer risk.¹²²

Recommendations

The current data indicates that patients with PsA have a higher prevalence of CVD and its risk factors but do not have an increased malignancy risk. Because PsA is a comorbidity of psoriasis, patients with psoriasis should be screened for the presence of PsA, because early detection and aggressive treatment appear to prevent joint damage.¹²³⁻¹²⁵ Patients with psoriasis should be monitored for the

development of PsA. While there are a number of instruments being developed for screening of patients with psoriasis for PsA, the simplest approach is to use the newly developed CASPAR (CLASSification criteria for Psoriatic ARthritis) criteria.¹²⁶ The CASPAR criteria include established inflammatory articular disease with at least 3 points from the following features: current psoriasis, a history of psoriasis (unless current psoriasis was present), a family history of psoriasis (unless current psoriasis was present or there was a history of psoriasis), dactylitis, juxtaarticular new bone formation, rheumatoid factor negativity, and nail dystrophy. Current psoriasis was assigned a score of 2, while all other features were assigned a score of 1. If indicated, these patients should be referred to a rheumatologist for confirmation of diagnosis and treatment. Patients with PsA should be assessed for risk factors for CVD. In addition, patients who have been treated with PUVA or cyclosporine for their psoriasis may be at increased risk for cancers, as are patients with psoriasis. Thus these patients should be monitored closely for the development of cancer. Although not proven to be increased in PsA, there is at least a hypothetically increased risk for cancer in patients treated with any immunomodulating agent.

OTHER IMMUNE-MEDIATED INFLAMMATORY DISEASES

Patients with immune-mediated inflammatory diseases (IMIDs) generally appear to be at higher risk of developing another IMID.¹²⁷ In addition to psoriatic arthritis, specific reports include an association of psoriasis with Crohn's disease.¹²⁸⁻¹³⁰ In a series of case-control studies, 7% to 11% of patients with Crohn's disease were diagnosed with psoriasis compared to 1% to 2% of controls.¹³¹⁻¹³³ Relatives of subjects diagnosed with either Crohn's or psoriasis also have been shown to have an increased incidence of having the other disease.¹³⁴ Genetic¹³⁵⁻¹³⁸ and pathologic¹³⁹⁻¹⁴² connections between these two diseases support these findings, and most recently, both have been linked to specific genotypes of interleukin-23.¹⁴³

Two studies have shown that psoriasis is more common in families with multiple sclerosis than in controls.^{129,130} Families with more than one case of multiple sclerosis had even higher odds of having psoriasis. Interestingly, while both are characterized by a TH₁ cytokine profile, multiple sclerosis appears to be exacerbated by tumor necrosis factor- α inhibition, an approach that is extremely effective in the treatment of psoriasis. As larger population-based data sets become available, these associations may become better characterized.

Recommendations

While there are no evidence- or consensus-based screening recommendations regarding IMIDs in psoriasis patients, clinicians should be aware of the associations so that they can recognize relevant symptoms, especially in patients on potentially exacerbating therapies.

CONCLUSION

Psoriasis is a complex disease that affects organs other than the skin in a significant number of cases. For the health care professional treating psoriasis, the minimum recommended screening for CVD, obesity, depression, infections, malignancies, psoriatic arthritis, and other IMIDs has been provided. While more research is needed to determine if additional screening is indicated for these patients, we feel this summary should result in a dialogue on how to best diagnose, monitor, and treat the comorbidities that are associated with psoriasis.

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