Inside Psoriatic Disease

DIABETES

Shared risk factors, common solutions

OUTLINE

Addressing multimorbidities: a challenge of the modern era

Addressing multimorbidities: a challenge of the modern era

The care of chronic noncommunicable diseases (NCDs) has always been a challenge for people, health care systems and economies around the world. The presence of more than one chronic condition in people living with NCDs (multimorbidity) adds an additional layer of complexity in the management of chronic NCDs. Even though the highest number of people living with multimorbid conditions belong to the older segment of the population, the increased burden of multimorbidities can only be partially attributed to ageing. Social factors, such as low income and education levels, are additionally linked to an increased prevalence in multimorbidities in all age groups. As mental health is more and more recognized as an intrinsic part of health, the full burden of multimorbidities must account for mental health.

Switching from a model of care where each disease is treated in silos to a person-centered model of care will ensure that multiple diseases are managed in a holistic way. A person-centered approach to care is particularly important for the management of psoriatic disease, as its systemic nature and proven link to multiple other conditions and mental health impacts make interventions focused only on skin lesions insufficient to address the full burden of the disease. Research has shown that people living with psoriatic disease are at risk of developing diabetes, and that other risk factors associated with diabetes are common in people living with psoriatic disease. Special attention should be given to individuals living with psoriatic disease regarding diabetes prevention and management. There are numerous benefits to screening and preventing diabetes in people living with psoriatic disease:

- Proper treatment of diabetes alleviates the additional burden of living with multiple chronic conditions while improving psoriatic disease itself, as interventions to prevent diabetes have beneficial effects on psoriatic disease
- Diabetes prevention translates to a lower cost for the individual and less time taken off work to attend doctors' appointments
- Health systems can reduce the costs associated with managing multiple comorbid conditions on top of psoriatic disease

Moreover, screening and preventing diabetes in people living with psoriatic disease would help governments honor their commitments to achieve the Sustainable Development Goals by reducing mortality due to NCDs and ensuring healthy lives for all.

Linking psoriatic disease to diabetes

Linking **psoriatic disease** to **diabetes**

Psoriatic disease is a systemic condition affecting multiple body sites. It is a chronic, noncommunicable, painful, disfiguring and disabling disease for which there is no cure, and which affects millions of people worldwide (1,2). Research has shown that a third of people with skin manifestations of psoriatic disease will most likely develop a type of inflammatory arthritis affecting joints and tendons. This condition is clinically called psoriatic arthritis. The World Health Organization (WHO) classifies psoriasis and psoriatic Arthritis as two separate diseases in their International Classification of Diseases. Psoriasis and psoriatic arthritis are related conditions because:

- around 30% of people with psoriasis develop psoriatic arthritis, with skin manifestations preceding joint symptoms by about 10 years,
- both conditions carry an increased risk of developing other co-morbid diseases,
- both psoriasis and psoriatic arthritis are associated with a high burden on mental health.

To best encapsulate the full burden of living with psoriasis and psoriatic arthritis, the term “psoriatic disease” has been suggested.

People living with psoriatic disease are at higher risk of developing diabetes, cardiovascular disease, metabolic syndrome, and inflammatory bowel disease. Moreover, psoriatic disease has a major impact on quality of life.

Psoriatic disease can impact people on many levels.

- **Physical**: Many people struggle with the symptoms of psoriatic disease, as they might feel pain a lot of the time, experience constant itching or burning and tiredness. Comorbid diseases also significantly impact health. While there are treatment options, it can take a long time to find the treatment that works best for each individual.
- **Emotional**: Psoriatic disease can be hard to deal with because of the stigma and prejudice attached to the disease. Depression and anxiety are prevalent among people living with psoriatic disease.
- **Social**: Living with psoriatic disease can have a big impact on relationships with family, friends, partners, co-workers or fellow students. Many people with psoriatic disease report feeling unsupported. Persistent myths about psoriatic disease such as that people with the disease are “unclean”, that they “caused their own psoriasis” or that the disease is contagious, are

untrue.

- **Economic**: There are significant costs associated with psoriatic disease. The medication may be very expensive or not covered by insurance providers. Absenteeism and presenteeism are higher in people with psoriatic disease compared to the general population. All of this may contribute to experience economic challenges.

Together, these factors can make psoriatic disease very difficult to bear (3).

Diabetes is a chronic condition where the body loses the ability to produce insulin, or to use insulin in the way it is meant to be used. Insulin is a hormone produced in the pancreas, that helps glucose pass from the blood stream into the cells of the body where it can be used for energy. When insulin is not produced, or when the cells are unable to use insulin to absorb glucose, an excess of glucose is left in the blood stream. This can have serious consequences on the individual because high levels of glucose in the blood can damage many organs including the heart, the eyes, the kidneys, and the nerve system (4).

There are three main types of diabetes:

- **Type 1 diabetes**, where very little or no insulin is produced by the body. This type of diabetes commonly develops in children and adolescents. It is unknown what causes type 1 diabetes. People living with type 1 diabetes require insulin injections and careful monitoring of the levels of glucose in the blood.
- **Type 2 diabetes** is the most common type of diabetes, accounting for around 90% of all diabetes cases. In type 2 diabetes, the body loses the ability to use the insulin that is produced. It is more common in older adults, but its prevalence is increasing in younger generations due to unhealthy diet and insufficient physical activity. Lifestyle interventions are critical in the management of type 2 diabetes, and medications and insulin injections are frequently prescribed.
- **Gestational diabetes**, that appears during pregnancy and generally disappears after it. Gestational diabetes can be damaging to the mother and the fetus.

Type 2 diabetes is the type of diabetes associated with psoriasis.

Multiple studies show an increased prevalence of type 2 diabetes for people living with psoriatic disease. Even people living with psoriatic diseases who do not have other conditions traditionally associated with diabetes, such as obesity,

had higher prevalence of diabetes compared to people that do not have psoriasis. Summarizing different studies conducted in different settings, people with psoriatic disease are twice more likely to develop diabetes, and the odds increase with the severity of psoriatic disease (5–7).

People with psoriatic disease are twice more likely to develop diabetes.

Genetics partially explain the association between psoriatic disease and diabetes, as both diseases share common genes (8), but genetics are not enough to explain the complex relationship between the two chronic conditions. Inflammation is another factor explaining the higher risk of diabetes in people with psoriatic disease. Although they are not yet completely understood, certain inflammatory mediators produced in psoriasis may predispose people to develop diabetes (9).

According to recent data released by the WHO, 7 out of 10 deaths worldwide in the decade 2000-2019 are attributable to NCDs (10). Diabetes has entered this inglorious top 10, partly because of the rise in the number of deaths from diabetes in lower-middle income countries. Data from the latest edition of the Diabetes Atlas, developed by the International Diabetes Federation, shows that 1 in 11 adults have diabetes, and that type 2 diabetes accounts for around 90% of diabetes cases worldwide. Its prevalence has steadily increased over the past few decades (11).

World leaders recognize the impact of diabetes on people's lives and agreed to take action for the prevention and control of diabetes in multiple occasions in the past decade. In 2011, a political declaration resulted from the first High Level Meeting of the United Nations on the prevention and control of NCDs defines NCDs as "a challenge of epidemic proportions" with "socio-economic and developmental impacts." This declaration focuses on diabetes and three other NCDs (cardiovascular disease, cancer and respiratory diseases) as health challenges requiring urgent action (12). The chosen approach to tackle these four NCDs is based on:

- strengthening mechanisms for prevention by reducing risk factors and promoting a healthy environment.
- reinforcing national policies and health systems by allocating resources and implementing evidence-based interventions.
- building international and multisectoral collaborations.

Global commitments against diabetes were reinforced with the adoption of the 2030 Agenda for Sustainable Development. In particular, the Sustainable Development Goal 3 promises to "ensure healthy lives and promote well-being for all at all ages." Subgoal 3.4 further pledges to "[by] 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being," including diabetes is an indicator (13,14).

The WHO's guidance on addressing diabetes is laid out in the WHO Global Report on Diabetes (15) in the Global Action Plan for the Prevention and Control of NCDs 2013-2020 (16) and in the WHO's Best Buys (17). Interventions against diabetes are mainly aimed at preventing the onset of type 2 diabetes by creating an enabling environment that fosters consumption of healthy food, reduction of unhealthy products, and increased physical activity. The guidance also highlights the importance of screening people at high risk of developing diabetes.

Taking action on psoriatic disease and diabetes:

shared risk factors, common solutions

Taking action on psoriatic disease and diabetes: shared risk factors, common solutions

Screening and management of diabetes in people with psoriatic disease

People with diabetes can live a long and healthy life if diabetes is diagnosed early and treated adequately. Many diabetes complications can be prevented (15). On the other hand, people with psoriatic disease are at an increased risk of developing diabetes. Therefore, it is important that screening be performed regularly, and adequate counselling be provided to prevent the insurgence of diabetes and all of its complications. Guidelines for the treatment of psoriatic disease published in the United States (7) and Europe (18) recommend screening for diabetes periodically, with eventually increased frequency if psoriatic disease is severe and if the medications used to manage psoriatic disease also have an impact on the ability of the body to handle glucose. The guidelines further include recommendations for the appropriate medication regime to treat people living with psoriatic disease who have diabetes or may develop diabetes due to the

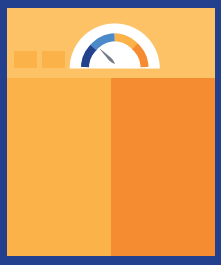
Guidelines for the treatment of psoriatic disease recommend screening for diabetes.

presence of multiple risk factors (18). Position statements on diabetes screening and care published by the American Diabetes Association recommend screening for diabetes in individuals with a certain Body Mass Index and other diabetes risk factors, but psoriatic disease is not included in that list of risk factors (19,20)

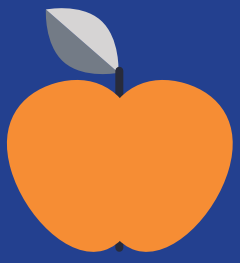
Preventing diabetes in people living with psoriatic disease: shared risk factors, common solutions

Diabetes is caused by a combination of factors. Genetics and age-related factors associated to diabetes cannot be modified. Other factors, like having obesity or higher weight, being physically inactive, and smoking, can be addressed by enabling behavioral changes (15). Some of the modifiable factors causing diabetes are common in people living with psoriatic disease and make psoriatic disease worse. Therefore, addressing risk factors in people living with psoriatic disease would bring the double benefit of improving psoriasis and preventing the insurgence of diabetes.

Addressing risk factors in people living with psoriatic disease would bring the double benefit of improving psoriasis and preventing the insurgence of diabetes.



Healthy Weight



Healthy Diet

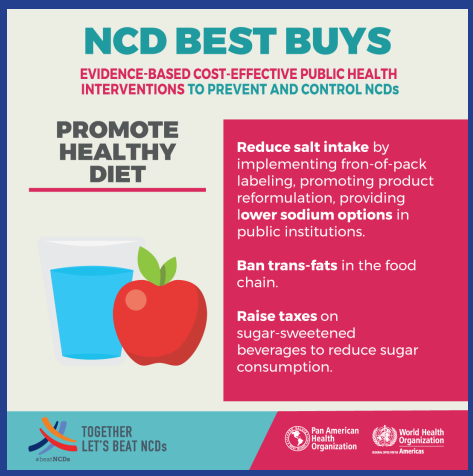
Quit Smoking

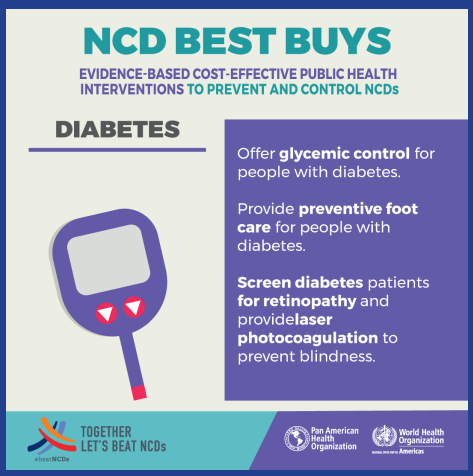
Higher weight and obesity are shared risk factors for both psoriatic disease and diabetes. There is an association between psoriatic disease and obesity, and research shows that people living with psoriasis are more likely to have obesity or higher weight, compared to people without psoriasis, with the odds of having

obesity increasing with the severity of psoriasis (21,22). Moreover, obesity complicates successful treatment of psoriasis, as some medications are less effective in people living with both psoriasis and obesity. There is encouraging evidence showing that weight reduction achieved through a low-calorie diet for people living with psoriatic disease and obesity may reduce the severity of psoriasis (23–26). It is still unclear if physical activity contributes to improving the skin manifestations of psoriatic disease, but moderate exercise is recommended for managing psoriatic arthritis (27). Weight reduction may also cause treatments for psoriatic disease to start working or work better, as stated by the American Academy of Dermatology (28).

Higher weight and obesity are also known risk factors for diabetes. To address this issue, WHO offers guidance to member states to facilitate the adoption of a healthier lifestyle through a healthy diet and physical exercise (15,17,29). The package of interventions includes policies aiming at reducing the level of salt, fat,

"Best buys" for the prevention and control of NCDs (17,33)





and sugar in food products, and favoring the consumption of fruit and vegetables. All interventions are listed in the WHO's "best buys" (Box x). Implementing these types of interventions for halting the rise of diabetes and obesity would benefit everyone but especially at-risk individuals such as those living with psoriatic disease.

Smoking is another modifiable risk factor common to both psoriatic disease and diabetes. Smoking makes psoriatic disease worse, and interventions such as smoking cessation programs have been shown to be helpful in addressing certain types of psoriasis, such as palmoplantar pustulosis (30). Moreover, smoking affects parts of the body responsible of making medicines effective, therefore impairing the effectiveness of treatments (31).

Smoking also has an impact on diabetes. The risk of developing diabetes is 30 to 40 percent higher in individuals that smoke compared to those who do not smoke. This is because chemicals contained in cigarettes cause inflammation and other harmful processes that play a role in causing diabetes. Furthermore, nicotine impairs the action of insulin, making the management of diabetes in smokers more difficult as a higher dose of insulin has to be administered. Smokers are also at greater risk of developing diabetes complications (32).

Psoriatic disease and diabetes: an expensive duo

The management of psoriatic disease is expensive for both the individual and for the health system (34,35). If the cost for managing comorbid diseases such as diabetes are added to the already high costs associated to psoriatic disease, the total costs increase further (34,36). Many studies have analyzed the costs of diabetes for individuals, health systems, and indirect costs due to the impact of the disease on professional life. All analyses agree that diabetes is an out-of-pocket expense for the individual (37,38), a substantial cost for health systems (37–43) and causes absenteeism and reduced productivity at work (38,42).

Direct costs of diabetes

Hospital Care

Medications for Treating Complications

Anti-Diabetic Agents and Supplies

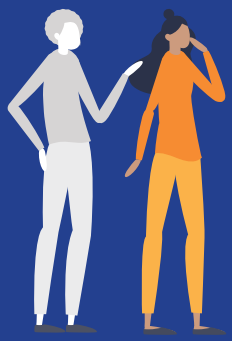
Doctors' Visits

Indirect costs of diabetes

Absenteeism

Reduced Productivity

Disability



Premature Death

A 2010 study conducted in the United States compared the economic costs associated with having psoriatic disease and comorbidities to the costs of having psoriatic disease without comorbidities, before the advent of biologic therapies. The study shows that people living with psoriatic disease and other comorbidities are more likely to use medical services and resources provided by the health care system, compared to people with psoriatic disease without comorbidities (44). The incremental costs associated with having diabetes amounted to 2823 USD in the 6-month period analyzed in the study. The same study reports that costs associated with cardiovascular disease are almost twice as high as the costs associated with diabetes, due to the high rate of hospitalizations and emergency care utilization for people living with both psoriatic disease and cardiovascular disease (44). Because diabetes is a risk factor for cardiovascular disease, the prevention of diabetes in people with psoriatic disease would save health systems the costs directly associated with diabetes care, and even go further to indirectly benefit health expenditures associated with cardiovascular disease as well. Results from a more recent study analyzing the same parameters but after the introduction of biologics corroborated these findings: the costs associated with psoriatic disease and diabetes were 1,5 times higher compared to the costs associated with psoriatic disease but without diabetes (44).

The costs associated with **psoriatic disease and diabetes** are 1.5x higher than the costs associated with psoriatic disease alone.

Lifestyle interventions are an effective non-drug intervention for preventing diabetes in people with psoriatic disease. Interventions such as weight reduction, increased physical activity, and smoking cessation have been shown to be effective in decreasing the risk of diabetes in the general population but even more so in individuals at risk of developing diabetes, such as people living with psoriatic disease. The advantage of implementing such lifestyle interventions in people living with psoriatic disease goes beyond the prevention of diabetes, as the same type of interventions are beneficial for psoriatic disease itself. The unique opportunity to prevent diabetes and alleviate the burden of psoriatic disease makes nutrition and smoking cessation counselling an important part of the holistic care of psoriatic disease.

As for weight reduction, increase in physical activity and smoking cessation are not easy to achieve. Plans specifically tailored to each individual's needs can increase the chances of such plans being followed in the long term (45). Achieving long-term measurable lifestyle changes in at-risk populations such as people living with psoriatic disease may require innovative solutions to be put in place, as people with psoriatic disease face unique barriers in terms of access to care and specialists compared to the general population. For example, community pharmacy-based weight management has been experimented in the UK, with encouraging results (46), highlighting the need of a broad involvement of all sectors of care if we want to achieve health for all. As shown by studies calculating the costs of living with psoriatic disease and additional comorbidities, preventing diabetes in people with psoriatic disease would have financial benefits for the individuals and for health care systems.

Existing barriers to the care of diabetes in people with psoriatic disease

Existing barriers to the care of diabetes in people with psoriatic disease

The WHO Global Report on Psoriasis (47) as well as multiple guidelines for the management of psoriatic disease developed by medical societies (7,18), patient organizations and national health authorities (48) highlight the importance of diabetes screening in people with psoriatic disease. Despite the existence of such guidelines, screening of diabetes is not routinely part of the management of psoriatic disease. A 2015 study shows that screenings for diabetes are not performed at most outpatient visits for psoriatic disease: less than 50% of the dermatologists participating to the survey answered that they perform screening for diabetes mellitus at least once every 3 years as recommended by guidelines for the screening of diabetes in at-risk populations (49). One potential explanation could be the lack of time to conduct such tests during the consultation, as there is a general agreement that the consultation time allotted to each patient is too short to address the whole burden of psoriatic disease on top of the skin examination (35,50).

Current projections show that the world is set to face a shortage of 18 million health care workers by 2030 (51), and specialist care in dermatology or diabetes is no exception. Moreover, specialists are often unevenly distributed on the countries' territories, with rural areas being unserved compared to urban areas (35,52,53).

The shortage of dermatologists and other health care workers is a barrier to address if we want to achieve a comprehensive care for psoriatic disease that includes screening and prevention of diabetes. One proposed solution is an increased involvement of primary care in psoriatic disease management (54). Primary care is perfectly placed to contribute significantly to a person-centered model of care for psoriatic disease, but there is broad consensus that general practitioners are not well informed about psoriatic disease and its comorbidities (55), even in countries where the prevalence of the disease is high (35).

In order to raise awareness on psoriatic disease, several tools have been developed by multiple organizations to help physicians and patients. The International Psoriasis Council routinely organizes webinars and symposia to increase awareness of the complexity of psoriatic disease and its optimal management (56). Large organizations such as the European Academy of Dermatology and Venereology and the American Academy of Dermatology, organize courses accessible through their online learning platform (57,58), that are also targeted towards general practitioners. However, the success of such tools depends on the personal interest of primary care physicians to take those

courses, therefore the availability of teaching tools does not directly translate to increased awareness among physicians (35).

Patient awareness is one of the factors contributing to the positive outcomes of psoriatic disease management. Awareness of the disease and therapeutic options is associated with more involvement in decisions related to therapy, increased quality of life and higher treatment satisfaction (59,60). Studies conducted on different cohorts show that only around half of people living with psoriatic disease could be considered "knowledgeable" about their condition and its associated comorbidities, including diabetes (61,62). Health care professionals, but also patient organizations, have a role to play into increasing awareness of diabetes in people living with psoriatic disease, and the importance of prevention and screening of diabetes.

Those who live with psoriatic disease and diabetes may face barriers to access diabetes care due to financial and social barriers to quality care. For example, inadequate health insurance coverage associated with prohibiting costs of insulin (63) and other medications can explain why diabetes care after diagnosis may be delayed or followed intermittently (64,65). When the expenses for diabetes care are added to those of psoriatic disease care, a condition that already has a high burden of out-of-pocket expenditures (66), the additional burden can overwhelm many household incomes.

Unequal levels of care in urban versus rural settings are another barrier for diabetes care, comparable to psoriatic disease care: workforce shortages and limitations in transportation options may cause people living with psoriatic disease and diabetes to miss their appointments with the doctors or to have a longer waiting time between appointments (64,67,68).

The WHO Global Report on Diabetes points out that availability of medications and diagnostics for diabetes are intermittently available in low-to-middle income countries (15). Medications commonly used to treat diabetes, such as metformin, gliclazide and insulin, are listed in the WHO Model List of Essential Medicines (69), but are not always available for those in need (15). The COVID-19 health emergency has further impaired the continuity of diabetes care. In a rapid assessment generated by WHO a few months after COVID-19 was declared a pandemic, it was shown that almost 50% of countries have reported disruptions in diabetes services, such as difficulties in following up doctors' appointments, opportunities for monitoring the blood glucose levels and access to medications (70). Moreover, limitations in movement and stay-at-home orders had a detrimental effect in terms of prevention and control of diabetes through diet and exercise (70,71).

Integrated care models require a surrounding environment enabling prevention,

screening, and management of multiple coexisting conditions. To achieve this, health systems need to go beyond disease-based siloed care and shift towards a person-centered model of care. A person-centered model of care for psoriatic disease that puts the person, and not the condition, at the center of health services would ensure that high quality care be delivered.

Recommendations & best practices

on diabetes prevention and care for people living with psoriatic disease

1 Inform people living with psoriatic disease about the importance of lifestyle changes such as weight reduction and smoking cessation to prevent diabetes, and support them in implementing lifestyle changes

Prevention of diabetes is the cornerstone of the solicited action against diabetes (4). Interventions aimed at increasing physical activity, contrasting obesity, and quitting smoking are suggested actions in the prevention and management of diabetes. Higher weight and smoking are modifiable risk factors for diabetes that are common in people living with psoriatic disease. Moreover, having obesity or higher weight, and smoking make psoriatic disease worse.

Weight reduction to contrast obesity and smoking cessation are cost-effective measures that would be beneficial for people living with psoriatic disease at-risk for diabetes. But sticking to a healthy diet, increase the amount of daily physical exercise and quit smoking is not easy. Therefore, people with psoriatic disease should be supported in their journey towards a healthier lifestyle if this is needed. A nutrition plan made together with specialists should be tailored to the person's lifestyle, to increase the chances of the plan be followed in the mid-to-long term. Even though the benefits of physical activity on psoriatic disease are still uncertain, physical activity is encouraged for the prevention of diabetes, thus it should be encouraged in people living with psoriatic disease in a highly tailored fashion, considering its impact on the joints and on the psychosocial wellbeing of each individual. Innovative solutions involving allied health care professionals should also be explored, especially in settings where nutritionists and other specialists are out of reach. Similarly, people living with psoriatic disease should be encouraged to participate in existing programs for smoking cessation for support in this difficult journey: frequently, people must try many different strategies, and many times, in order to successfully quit smoking.

Case Study in psoriasis: An online weight-loss coaching program for people with psoriatic disease – pilot study (72)

People living with psoriatic disease and obesity or higher weight were offered a web-based program to support weight loss. The program was comprehensive and tailored to the need of each individual, and included:

- Diet plan with calorie intake calculated from the person's individual circumstances;

- Simple recipes for all relevant meals according to the defined calorie intake;
- Weekly timetables for physical exercise;
- Advice on behaviors, such as replacing unhealthy food with healthier alternatives and tips for eating out;
- Personal contact with a doctor and nurse during clinical consultations;
- Telephone contact with a nutritionist;
- Support for keeping up with the program.

The system allowed users to record the daily calorie intake.

After 12 weeks, the mean weight of the group of participants decreased of 3%, with some people losing over 8% of their weight. Virtually no weight loss (0,2%) was observed in the control group.

Although the effect on diabetes risk was not evaluated, and the study was too short to assess the impact on the severity of psoriasis, this pilot study represents a promising start of a highly tailored program introducing lifestyle changes for people living with psoriatic disease.

2 Perform routine screening for diabetes in people with psoriatic disease

Existing guidelines for psoriatic disease recommend screening for diabetes, but despite the recommendations, a routine screening for diabetes is not yet part of the care of psoriatic disease.

Diabetes complications can be prevented with early diagnosis and correct management. Therefore, it is essential that screening for diabetes become part of the management of psoriatic disease. With screening and early diagnosis, complications will be prevented and the global target for diabetes will be achieved (16).

Case Study in psoriasis: Screening for cardiovascular disease risk factors in primary care (73)

People living with psoriatic disease were sent an invitation by their general practitioner to participate in a screening for cardiovascular risk factors, including diabetes, at the practitioner's office.

Six percent of people participating in the study had a known diagnosis of diabetes. After the screening, 3,1% percent of the study participants were newly diagnosed with diabetes, an increase of roughly 50%.

The screening also assessed how well diabetes was managed in individuals with a known diagnosis. The results showed that one quarter of participants (26%) had suboptimal level of blood glucose, therefore their condition was not well controlled.

The study shows the benefits of proactively offering screening to people living with psoriatic disease, as targeted screening of people living with psoriatic disease would ensure early diagnosis and correct suboptimal control of diabetes in this at-risk population.

3 Implement information program on common psoriatic disease comorbidities, including diabetes, for people living with psoriatic disease

Being informed on what psoriatic disease entails is the first steps towards forming a successful partnership between the person living with the disease and their health care team: when decisions are made together, they are more likely to succeed. Information makes people better at discerning what to do and what not to do according to what they want from their health care.

Information on the risk of diabetes in people living with psoriatic disease, on the importance of screening for diabetes and on the prevention of diabetes should be provided to people living with psoriatic disease. Patient associations and health care providers are optimally positioned to provide accurate information to people living with psoriatic disease on these topics.

Case Study in psoriasis: A multidisciplinary educational program on psoriatic disease for people living with psoriatic disease (74,75)

The study participants (people living with psoriatic disease or with atopic dermatitis) took part in a 12-week educational program. The following types of training were included in the program:

- Information on their disease (by a dermatologist)
- Lifestyle, including diet, physical training and smoking cessation (by a dietician, a training expert and a psychologist)
- Stress-reduction techniques (by sports and yoga teachers)
- Psycho-dermatology interventions (by a psychiatrist and a philosopher)

In addition to the information on the importance of quitting smoking included in the program, smoking cessation counselling was offered.

Results of the study showed that some of the people participating in the educational program reduced their quantity of cigarettes or quit smoking. People participating to the program were also significantly more physically active compared to those who did not participate in the program. Overall, this study shows that targeted educational programs have the potential to influence behaviors and lead to positive change in lifestyle habits associated with increased diabetes risk.

4 Increase the skills and capacity of health care professionals, especially in primary care

Education programs for health care professionals on psoriatic disease, targeted to primary care workers in areas lacking specialists, would ensure that health care workers have the skills to provide comprehensive care to people living with psoriatic disease. More awareness of the risk of diabetes in people living with psoriatic disease, and of the importance of screening and lifestyle counselling to prevent diabetes and ameliorate psoriatic disease would be the first step towards a model of care that goes beyond the treatment of skin manifestations.

Case Study in diabetes: Improving patient outcomes through increasing provider knowledge (76)

Physicians in primary care participated in a multiple platform curricula as part of their Continuing Medical Education focused on how to maintain control of the levels of glucose in the blood, thus avoiding suboptimal glycemic control. The curricula included both a live didactic session and an interactive online case-based session. The latter part of the curricula was tailored to each primary care physician based on knowledge gaps identified after the didactic session. After the end of the curricula, patient charts were reviewed after 3 months and 6 months to assess the impact of the educational curricula on patient health outcomes. Changes in knowledge of the participants were assessed after the course.

Test scores assessing the efficacy of the curricula in increasing providers' knowledge were generally significantly higher after the course was completed, thus showing that the education was effective in increasing the participants' general knowledge on the subject. More importantly, the study shows an improvement in patient outcomes, measured as an amelioration of parameters related to the concentration of glucose in the blood recorded in patient charts after a 3-month and a 6-month follow-up. Therefore, the curricula may have been beneficial in equipping providers with more skills to be successful in their daily practice.

5 Ensure continuity of care for psoriatic disease and its comorbid conditions in times of health emergencies

The world needs to learn from the experience of dealing with COVID-19, to ensure that we all are better prepared to face future health emergencies. Other than promoting lifestyles to prevent and manage diabetes in an effective way, governments and health systems need to make sure that disruption of care will not be repeated. Essential health services for diabetes and psoriatic disease should be maintained even in times where health systems are pressed by other emergencies, through reconfiguration of primary and specialist treatment services and preparation of plans to resume access to full services at the appropriate time. Telemedicine and digital tools should be employed to ensure continuity of care, and people living with psoriatic disease in need of services should be supported in accessing them.

Case Study in diabetes: Reorganizing diabetes care in times of COVID-19 (77)

During spring 2020, when cases of COVID-19 were rising, the Portuguese Diabetes Association clinic in Lisbon proactively reconfigured services for diabetes care. The clinic personnel rescheduled all the upcoming in-person appointments to take place via telephone or videoconference, depending on preference and capabilities of their patients. Information on available emergency services were distributed to all people living with diabetes connected to the clinic. The clinic organized webinars on diabetes self-management and disseminated information on diabetes and COVID-19 through social media.

The rearrangement of services for diabetes at the clinic was a collective effort of multiple stakeholders, from health authorities speeding up permits for teleconsultation, to managers reallocating budgets, to the clinic personnel who was involved in re-designing the diabetes services. The reconfiguration of services at the Portuguese Diabetes Association clinic is a successful attempt to maintain the continuity of care for diabetes while safeguarding the health of people living with diabetes during a health emergency.

References

1. WHO Resolution – International Federation of Psoriasis Associations [Internet]. [cited 2021 Feb 12]. Available from: https://ifpa-pso.com/our-actions/advocacy/who-resolution/

2. The Leading Resource on Psoriasis | Global Psoriasis Atlas [Internet]. [cited 2021 Feb 12]. Available from: https://globalpsoriasisatlas.org/

3. Our Cause – International Federation of Psoriasis Associations [Internet]. [cited 2021 Feb 12]. Available from: https://ifpa-pso.com/our-cause/

4. What is diabetes [Internet]. [cited 2021 Feb 12]. Available from: https://idf.org/aboutdiabetes/what-is-diabetes.html

5. Mehta NN, Azfar RS, Shin DB, Neimann AL, Troxel AB, Gelfand JM. Patients with severe psoriasis are at increased risk of cardiovascular mortality: cohort study using the General Practice Research Database. European heart journal [Internet]. 2009/12/27. 2010 Apr;31(8):1000–6. Available from: https://pubmed.ncbi.nlm.nih.gov/20037179

6. AL-MUTAIRI N, AL-FARAG S, AL-MUTAIRI A, AL-SHILTAWY M. Comorbidities associated with psoriasis: An experience from the Middle East. The Journal of Dermatology [Internet]. 2010 Feb 1;37(2):146–55. Available from: https://doi.org/10.1111/j.1346-8138.2009.00777.x

7. Elmets CA, Leonardi CL, Davis DMR, Gelfand JM, Lichten J, Mehta NN, et al. Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with awareness and attention to comorbidities. Journal of the American Academy of Dermatology. 2019 Apr 1;80(4):1073–113.

8. Patrick MT, Stuart PE, Zhang H, Zhao Q, Yin X, He K, et al. Causal Relationship and Shared Genetic Loci between Psoriasis and Type 2 Diabetes through Trans-Disease Meta-Analysis. Journal of Investigative Dermatology. 2020;

9. Granata M, Skarmoutsou E, Trovato C, Rossi GA, Mazzarino MC, D'Amico F. Obesity, Type 1 Diabetes, and Psoriasis: An Autoimmune Triple Flip. Vol. 84, Pathobiology. S. Karger AG; 2017. p. 71–9.

10. The top 10 causes of death [Internet]. [cited 2021 Feb 12]. Available from: https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death

11. IDF Diabetes Atlas 9th edition 2019 [Internet]. [cited 2021 Feb 12]. Available from: https://www.diabetesatlas.org/en/

12. WHO | United Nations high-level meeting on noncommunicable disease prevention and control. WHO [Internet]. 2015 [cited 2021 Feb 12]; Available from: http://www.who.int/nmh/events/un_ncd_summit2011/en/

13. Goal 3 | Department of Economic and Social Affairs [Internet]. [cited 2021 Feb 12]. Available from: https://sdgs.un.org/goals/goal3

14. Goal 3 targets | UNDP [Internet]. [cited 2021 Feb 12]. Available from: https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-3-good-health-and-well-being/targets.html

15. Roglic G, World Health Organization. Global report on diabetes. 2016. 86.

16. World Health Organization. Global action plan for the prevention and control of noncommunicable diseases : 2013-2020. 103.

17. World Health Organization. Tackling NCDs: "best buys" and other recommended interventions for the prevention and control of noncommunicable diseases [Internet]. Geneva: World Health Organization; 2017. Available from: https://apps.who.int/iris/handle/10665/259232

18. Nast A, Smith C, Spuls PI, Avila Valle G, Bata-Csörgö Z, Boonen H, et al. EuroGuiDerm Guideline for the systemic treatment of psoriasis vulgaris. 2020.

19. American Diabetes Association. Screening for type 2 diabetes. Diabetes Care [Internet]. 2003 Jan 1 [cited 2021 Feb 12];26(SUPPL. 1):s21–4. Available from: https://care.diabetesjournals.org/content/26/suppl_1/s21

20. American Diabetes Association. Standards of medical care in diabetes - 2013. Vol. 36, Diabetes Care. 2013.

21. Jensen P, Skov L. Psoriasis and Obesity. Dermatology [Internet]. 2016;232(6):633–9. Available from: https://www.karger.com/DOI/10.1159/000455840

22. Budu-Aggrey A, Brumpton B, Tyrrell J, Watkins S, Modalsli EH, Celis-Morales C, et al. Evidence of a causal relationship between body mass index and psoriasis: A mendelian randomization study. PLoS Medicine. 2019;16(1).

23. Ko S-H, Chi C-C, Yeh M-L, Wang S-H, Tsai Y-S, Hsu M-Y. Lifestyle changes for treating psoriasis. Cochrane Database of Systematic Reviews [Internet]. 2019 Jul 16 [cited 2021 Feb 16];(7). Available from: http://doi.wiley.com/10.1002/14651858.CD011972.pub2

24. Upala S, Sanguankeo A. Effect of lifestyle weight loss intervention on disease severity in patients with psoriasis: A systematic review and meta-analysis. Vol. 39, International Journal of Obesity. 2015.

25. Alotaibi HA. Effects of Weight Loss on Psoriasis: A Review of Clinical Trials. Cureus. 2018;

26. Fleming P. Lifestyle intervention in psoriasis: A new avenue for treatment? Vol. 104, American Journal of Clinical Nutrition. 2016.

27. Roger-Silva D, Natour J, Moreira E, Jennings F. A resistance exercise program improves functional capacity of patients with psoriatic arthritis: a randomized controlled trial. Clinical Rheumatology [Internet]. 2018;37(2):389–95. Available from: https://doi.org/10.1007/s10067-017-3917-x

28. Healthy diet and other lifestyle changes that can improve psoriasis [Internet]. [cited 2021 Feb 16]. Available from: https://www.aad.org/public/diseases/psoriasis/insider/diet

29. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. Vol. 54, British Journal of Sports Medicine. 2020.

30. Michaëlsson G, Gustafsson K, Hagforsen E. The psoriasis variant palmoplantar pustulosis can be improved after cessation of smoking [8]. Journal of the American Academy of Dermatology. 2006;54(4).

31. Zhou H, Wu R, Kong Y, Zhao M, Su Y. Impact of smoking on psoriasis risk and treatment efficacy: a meta-analysis. The Journal of international medical research [Internet]. 2020 Oct;48(10):300060520964024–300060520964024. Available from: https://pubmed.ncbi.nlm.nih.gov/33121308

32. Cigarette Smoking: A Risk Factor for Type 2 Diabetes | FDA [Internet]. [cited 2021 Feb 17]. Available from: https://www.fda.gov/tobacco-products/health-information/cigarette-smoking-risk-factor-type-2-diabetes

33. PAHO/WHO | “Best buys” for the prevention and control of NCDs [Internet]. [cited 2021 Mar 3]. Available from: https://www.paho.org/hq/index.php?option=com_content&view=article&id=14418:ncds-graphic-materials-best-buys&Itemid=1969&lang=en

34. Pilon D, Teeple A, Zhdanava M, Ladouceur M, Ching Cheung H, Muser E, et al. The economic burden of psoriasis with high comorbidity among privately

insured patients in the United States. Journal of Medical Economics. 2019 Feb 1;22(2):196–203.

35. Psoriatic Disease Response Index — Global Psoriasis Coalition [Internet]. [cited 2021 Feb 12]. Available from: https://www.globalpsoriasiscoalition.org/psoindex

36. Kimball AB, Guérin A, Tsaneva M, Yu AP, Wu EQ, Gupta SR, et al. Economic burden of comorbidities in patients with psoriasis is substantial. Journal of the European Academy of Dermatology and Venereology. 2011 Feb;25(2):157–63.

37. Arredondo A, Barceló A. The economic burden of out-of-pocket medical expenditures for patients seeking diabetes care in Mexico [2]. Vol. 50, Diabetologia. 2007. p. 2408–9.

38. The Cost of Diabetes | ADA [Internet]. [cited 2021 Feb 16]. Available from: https://www.diabetes.org/resources/statistics/cost-diabetes

39. Organisation for Economic Co-operation and Development (OECD), European Commission. Health at a Glance: Europe 2018 [Internet]. OECD; 2018. (Health at a Glance: Europe). Available from: https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-europe-2018_health_glance_eur-2018-en

40. Kanavos P, van den Aardweg S, Schurer W. Diabetes expenditure, burden of disease and management in 5 EU countries. 2012.

41. Zinash A, Birhanu Demeke W, Solomon Ahmed M, Moges Workneh A. Economic Assessment of Direct Cost of Illness of Diabetes Mellitus at Dessie Referral Hospital, North East Ethiopia. International Journal of Diabetes and Clinical Research. 2020 May 6;7(2).

42. Kieu TTM, Trinh HN, Pham HTK, Nguyen TB, Ng JYS. Direct non-medical and indirect costs of diabetes and its associated complications in Vietnam: an estimation using national health insurance claims from a cross-sectional survey. BMJ Open [Internet]. 2020 Mar 1;10(3):e032303. Available from: http://bmjopen.bmj.com/content/10/3/e032303.abstract

43. Arredondo A, Zúñiga A. Economic Consequences of Epidemiological Changes in Diabetes in Middle-Income Countries. Diabetes Care [Internet]. 2004 Jan 1;27(1):104. Available from: http://care.diabetesjournals.org/content/27/1/104.abstract

44. Feldman SR, Tian H, Gilloteau I, Mollon P, Shu M. Economic burden

of comorbidities in psoriasis patients in the United States: results from a retrospective U.S. database. BMC Health Services Research [Internet]. 2017;17(1):337. Available from: https://doi.org/10.1186/s12913-017-2278-0

45. Koliaki C, Spinos T, Spinou M, Brinia M-E, Mitsopoulou D, Katsilambros N. Defining the Optimal Dietary Approach for Safe, Effective and Sustainable Weight Loss in Overweight and Obese Adults. Healthcare. 2018;6(3).

46. Evans G, Wright D. Long-Term Evaluation of a UK Community Pharmacy-Based Weight Management Service. Pharmacy. 2020;8(1).

47. Michalek IM, Loring B, John SM, World Health Organization. Global report on psoriasis. 2016. 44.

48. Socialstyrelsen - The National Board of Health and Welfare - Sweden. Nationella riktlinjer för vård vid psoriasis Stöd för styrning och ledning [Internet]. Available from: www.socialstyrelsen.se,

49. Manalo IF, Gilbert KE, Wu JJ. Survey of trends and gaps in dermatologists' cardiovascular screening practices in psoriasis patients: Areas still in need of improvement. Journal of the American Academy of Dermatology [Internet]. 2015 Nov 1;73(5):872-874.e4. Available from: https://doi.org/10.1016/j.jaad.2015.07.029

50. van de Kerkhof PCM, Reich K, Kavanaugh A, Bachelez H, Barker J, Girolomoni G, et al. Physician perspectives in the management of psoriasis and psoriatic arthritis: Results from the population-based Multinational Assessment of Psoriasis and Psoriatic Arthritis survey. Vol. 29, Journal of the European Academy of Dermatology and Venereology. Blackwell Publishing Ltd; 2015. p. 2002–10.

51. Health workforce [Internet]. [cited 2021 Mar 4]. Available from: https://www.who.int/health-topics/health-workforce#tab=tab_1

52. Vaidya T, Zubritsky L, Alikhan A, Housholder A. Socioeconomic and geographic barriers to dermatology care in urban and rural US populations. Journal of the American Academy of Dermatology. 2018;78(2).

53. Feng H, Berk-Krauss J, Feng PW, Stein JA. Comparison of dermatologist density between urban and rural counties in the United States. JAMA Dermatology. 2018;154(11).

54. Psoriasis & Primary Care Report Beyond Gatekeeping: Effective Primary Care Support in the Management of Psoriasis & Psoriatic Arthritis [Internet].

[cited 2021 Feb 12]. Available from: https://www.jaad.org/article/S0190-9622

55. Parsi KK, Brezinski EA, Lin TC, Li CS, Armstrong AW. Are patients with psoriasis being screened for cardiovascular risk factors? A study of screening practices and awareness among primary care physicians and cardiologists. Journal of the American Academy of Dermatology. 2012;67(3).

56. IPC - Education [Internet]. [cited 2021 Feb 12]. Available from: https://www.psoriasiscouncil.org/education/default.htm

57. EADV | European Academy of Dermatology and Venereology [Internet]. [cited 2021 Feb 12]. Available from: https://www.eadv.org/learning-centre

58. Learning module: Psoriasis [Internet]. [cited 2021 Feb 12]. Available from: https://www.aad.org/member/education/residents/bdc/psoriasis

59. Renzi C, di Pietro C, Tabolli S. Participation, satisfaction and knowledge level of patients with cutaneous psoriasis or psoriatic arthritis. Clinical and Experimental Dermatology. 2011;36(8).

60. Renzi C, di Pietro C, Gisondi P, Chinni LM, Fazio M, Ianni A, et al. Insufficient knowledge among psoriasis patients can represent a barrier to participation in decision-making. Acta Dermato-Venereologica. 2006;86(6).

61. Wahl AK, Moum T, Robinson HS, Langeland E, Larsen MH, Krogstad AL. Psoriasis patients' knowledge about the disease and treatments. Dermatology Research and Practice. 2013;2013. *

62. Bubak C, Schaarschmidt ML, Schöben L, Peitsch WK, Schmieder A. Analyzing the value of an educational program for psoriasis patients: A prospective controlled pilot study. BMC Public Health. 2019;19(1).

63. Mulcahy AW, Schwam D, Edenfield N. Comparing Insulin Prices in the United States to Other Countries: Results from a Price Index Analysis [Internet]. RAND Corporation; 2020. Available from: https://www.rand.org/pubs/research_reports/RRA788-1.html

64. Zgibor JC, Songer TJ. External Barriers to Diabetes Care: Addressing Personal and Health Systems Issues. Diabetes Spectrum. 2001;14(1).

65. Nam S, Chesla C, Stotts NA, Kroon L, Janson SL. Barriers to diabetes management: Patient and provider factors. Vol. 93, Diabetes Research and Clinical Practice. 2011.

66. Bhutani T, Wong JW, Bebo BF, Armstrong AW. Access to health care in patients with psoriasis and psoriatic arthritis: Data from national psoriasis foundation survey panels. JAMA Dermatology. 2013;149(6).

67. Why Diabetes is a Concern for Rural Communities - RHIhub Toolkit [Internet]. [cited 2021 Feb 19]. Available from: https://www.ruralhealthinfo.org/toolkits/diabetes/1/rural-concerns

68. Ugwu E, Onung S, Ezeani I, Olamoyegun M, Adeleye O, Uloko A. Barriers to Diabetes Care in a Developing Country: Exploratory Evidence from Diabetes Healthcare Providers. Journal of Advances in Medicine and Medical Research. 2020;

69. WHO Model Lists of Essential Medicines [Internet]. [cited 2021 Feb 19]. Available from: https://www.who.int/groups/expert-committee-on-selection-and-use-of-essential-medicines/essential-medicines-lists

70. Khader MA, Jabeen T, Namoju R. A cross sectional study reveals severe disruption in glycemic control in people with diabetes during and after lockdown in India. Diabetes & metabolic syndrome [Internet]. 2020/08/18. 2020;14(6):1579–84. Available from: https://pubmed.ncbi.nlm.nih.gov/32858476

71. Hartmann-Boyce J, Morris E, Goyder C, Kinton J, Perring J, Nunan D, et al. Diabetes and COVID-19: Risks, management, and learnings from other national disasters. Diabetes Care. 2020;43(8).

72. Gerdes S, Dethlefs B, Personke Y, Storim J, Mrowietz U. Online weight-loss coaching for patients with psoriasis: Results of a pilot study. Vol. 174, British Journal of Dermatology. 2016.

73. Rutter MK, Kane K, Lunt M, Cordingley L, Littlewood A, Young HS, et al. Primary care-based screening for cardiovascular risk factors in patients with psoriasis. British Journal of Dermatology. 2016;175(2).

74. Bostoen J, Bracke S, de Keyser S, Lambert J. An educational programme for patients with psoriasis and atopic dermatitis: A prospective randomized controlled trial. British Journal of Dermatology. 2012;167(5).

75. Lambert J, Bostoen J, Geusens B, Bourgois J, Boone J, de Smedt D, et al. A novel multidisciplinary educational programme for patients with chronic skin diseases: Ghent pilot project and first results. Archives of Dermatological Research. 2011;303(1).

76. Lee B, Trence D, Inzucchi S, Lin J, Haimowitz S, Wilkerson E, et al. Improving Type 2 Diabetes Patient Health Outcomes with Individualized Continuing Medical Education for Primary Care. Diabetes therapy : research, treatment and education of diabetes and related disorders [Internet]. 2016/06/06. 2016 Sep;7(3):473–81. Available from: https://pubmed.ncbi.nlm.nih.gov/27272527

77. World Health Organization Regional Office of Europe. Ensuring people-centred diabetes care during the COVID-19 pandemic Experiences from Portugal. 2020.

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