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ORIGINAL ARTICLE

Determining what represents value in the treatment of prurigo nodularis and its key unmet needs in Spain through Multi-Criteria Decision Analysis

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Abstract

Background: Prurigo nodularis (PN) is a chronic, debilitating dermatologic disease characterised by the presence of highly pruritic nodular lesions. PN highly impacts on patients' quality of life as there are no specific treatments available in Spain.

Objectives: Determine the main value drivers in the treatment of PN in Spain and its main unmet needs using Multi-Criteria Decision Analysis (MCDA).

Methods: Literature review to synthesise relevant evidence in an evidence matrix based on the MCDA EVIDEM framework adapted to Spain. A multidisciplinary panel composed of dermatologists, hospital pharmacists and a patient weighted (5-point scale; 0 minimum importance, 5 maximum importance) and scored each criterion included in the framework (from −5 to 5 or 0 to 5 depending on the criterion). Results were discussed in a reflective group session.

Results: PN was considered a severe (3.3 ± 0.7) and infrequent (2.0 ± 0.7) disease, with high unmet needs (4.2 ± 0.7) mainly due to the lack of available treatments with specific indication for PN. Current off-label treatments were perceived to have limited efficacy/effectiveness (1.8 ± 1.1), an unfavourable long-term safety profile (2.1 ± 0.9) and low therapeutic impact (1.7 ± 1.1). The measure of patient-reported outcomes (2.7 ± 0.9) was perceived as important, but available tools are not specific. Although the cost of available treatments was not considered high (2.4 ± 1.5), experts agreed that PN is associated with moderately high other medical costs (3.6 ± 1.1) and indirect costs (3.1 ± 0.9). Experts considered that current guidelines and consensus (2.6 ± 0.7) are not clear on severity criteria and treatment algorithm. The quality of evidence (1.4 ± 0.5) of currently used off-label treatments was perceived as low due to a lack of published clinical trials.

Conclusions: PN was considered a severe disease associated with relevant unmet needs, including the lack of specific and effective treatments for PN, the lack of consensus on the disease definition, defined severity criteria, prevalence estimations and awareness of PN in Spain.

KEYWORDS
decision-making, MCDA, Multi Criteria Decision Analysis, Multi-Criteria Decision Analysis, prurigo nodularis, unmet needs

INTRODUCTION

Prurigo nodularis (PN) is a chronic skin disease characterised by the presence of nodular lesions associated with intense and relentless itching for more than 6 weeks, resulting in severe deterioration of patients' quality of life.[1–3] Recent studies estimate a prevalence between 3.27 and 11.1/10,000 inhabitants,[4–6] being more common in people aged 50–60 years and individuals with dark skin.[7]

PN occurs due to an itching neuronal sensitivity, caused by an inflammatory response in the skin through mediators as interleukin (IL)-31 and eosinophils, and neuronal dysregulation, that leads to the itching-scratch cycle.[1–3,8–10]

Patients with PN present multiple comorbidities such as endocrine, cutaneous or cardiovascular diseases.[8] It is considered a disabling disease due to the intensity of the pruritus suffered by patients, seriously impairing their quality of life.[11] It is associated with high direct costs, mainly due to visits to various specialists, and indirect costs due to the loss of productivity.[12–15]

There is currently a lack of a consensus definition of the disease, which differs among available current guidelines from the main international groups of dermatologists.[2,16,17] Additionally, disease awareness among specialists is also variable, which makes diagnosis and patient management difficult.[2,16]

Currently, there are no reimbursed treatments with a specific indication for PN available in Spain.[2] Thus, off-label alternatives are being used to manage the underlying itching disease, but the efficacy is limited, and long-term safety data is not available due to the lack of randomised controlled clinical trials[1,17,18] and the lack of long-term follow-up data.[19] Off-label treatment is used to manage pruritus and neuronal inflammation, and it is based on topical (e.g., corticosteroids) and systemic therapy (e.g., phototherapy, immunosuppressants and neuromodulators) on an individualised basis.[17,20]

Given the lack of a published consensus on the definition of PN, defined severity criteria, prevalence estimations and awareness of PN in Spain, it is necessary to generate evidence on the current situation of PN, its value drivers and current unmet needs.

Reflective Multi-Criteria Decision Analysis (MCDA) methodology allows to determine main value drivers and the main unmet needs in a given indication considering a framework that includes all relevant criteria for health-care decision-making from the perspective of all relevant stakeholders.[21,22] MCDA methodology is already being used in Spain to assess the value contribution of new treatments at regional[23,24] and hospital level.[25]

The aim of this study is to determine the main value drivers in the treatment of PN and to identify the current main unmet needs in Spain through MCDA from a multidisciplinary perspective.

MATERIALS AND METHODS

The study was designed according to MCDA methodology best practices.[21,22]

Selection and structuring criteria

The validated MCDA EVIDEM 4.0 (12) framework adapted to Spain by 98 Spanish evaluators and decision-makers at national and regional levels[26] was used, consisting of 12 quantitative criteria and 3 contextual criteria (Table 1).

Literature review

A literature review (LR) was conducted to identify relevant evidence for each criterion included in the MCDA framework. Evidence was searched in biomedical databases (MEDLINE through PubMed, Cochrane and MEDES) and grey literature.

The LR included publications in Spanish and English that had been published in the last 5 years. Exclusion

TABLE 1 Criteria included in the MCDA EVIDEM 4.0 framework adapted to Spain by 98 Spanish evaluators and decision-makers at national and regional levels.[26]

Quantitative criteria
• Severity of the disease
• Size of the affected population
• Unmet needs
• Efficacy/effectiveness
• Safety/tolerability
• Patient-reported outcomes (PROs)
• Therapeutic impact
• Cost of treatment
• Other medical costs
• Indirect costs
• Quality of evidence
• Expert consensus and clinical practice guidelines
Qualitative criteria
• Scope of healthcare system population access priorities
• Common goals and specific interests
• System capacity and appropriate use of intervention

criteria were duplicated articles, articles written in other languages, articles not including PN, articles which mention PN but focused on other pathologies, paediatric studies and studies based on non-pharmacological management of PN and developed in animals.

Criteria weighting

A multidisciplinary panel composed of five dermatologists, three hospital pharmacists and one patient affected with PN participated in this study.

Participants took part in an online meeting where they were trained in MCDA methodology and individually completed a weighting exercise with the criteria included in the MCDA framework: each participant was assigned a weight between 1 (minimum relative importance) and 5 (maximum relative importance) to each of the 12 quantitative criteria of the MCDA framework based on their personal value perceptions.

Weighting results were analysed using Microsoft Excel to obtain the mean, standard deviation (SD) and range of minimum and maximum scores. Results were discussed during the same session, where participants shared their reflections on the assigned weighting scores.

Evidence matrix development

The retrieved evidence for each criterion included in the MCDA framework through the LR was synthesised in an MCDA evidence matrix.

Criteria scoring

After weighing the criteria, the evidence matrix was sent to participants to individually score the importance of each criterion. Since the study is focused on assessing a healthcare problem and not the comparison between two treatments, the score scale ranged from 0 (minimum score value) to 5 (maximum score value). Contextual criteria were scored using a 3-point qualitative scale: positive, neutral or negative impact.

Data was collected individually from each participant and analysed using Microsoft Excel. Results were calculated and shown to participants in the form of mean, SD and range of minimum and maximum scores. Results were analysed and discussed through a reflective discussion during a second online meeting. MCDA does not aim to reach a consensus on scores or to establish a cut-off value; scores are used as a basis for stimulating the reflective discussion and as a reflection of participants' value perceptions.

Re-scoring

After the group discussion, the evidence matrix was sent again to participants so they could modify the assigned value score, if they wanted, after the group discussion. All participants reviewed and validated their scores. Results were analysed using Student's t test to see if there were statistically significant differences. The results of re-scores have been included in the present publication.

RESULTS

Literature review and evidence matrix development

A total of 217 publications from biomedical databases ($n = 198$) and grey literature ($n = 19$) were identified, and from these, a total number of 23 publications were included. Remaining publications ($n = 194$) were excluded based on title, abstract ($n = 184$) and/or full-text screening ($n = 10$). The number of references selected/discarded is represented on a PRISMA flow diagram (Figure 1).[27] The MCDA evidence matrix was populated with the evidence found through the LR.

Quantitative criteria weighting

'Severity of the disease' (4.6 ± 0.5) was perceived as the most important criterion, followed by 'Efficacy/

Effectiveness' (4.6 ± 0.5) and 'Safety/tolerability' (4.4 ± 0.7) of the treatment (Figure 2). Participants stressed the importance of the manageability of possible adverse effects and potential interactions, especially in those pathologies in which several treatments are administered concomitantly.

'Unmet needs' (4.2 ± 0.7) and 'Therapeutic impact' (4.1 ± 0.6) of a treatment were also considered highly relevant. Experts highlighted that existing unmet needs are highly considered in healthcare evaluation and decision-making, becoming more important in those pathologies without therapeutic alternatives available or when treatments are not effective and do not have an adequate safety profile.

'Quality of evidence' was considered very relevant (4.2 ± 0.4). Participants perceived that the quality of the evidence on which the efficacy and safety data of a treatment is based would directly affect how clinical data on these two criteria will be valued.

'Patient-reported outcomes (PROs)' was also considered relevant (4.0 ± 0.7). All participants mentioned that PROs are increasingly relevant and that patients should be involved in decision-making, as patient perception can affect adherence and persistence.

There was dispersion in the weighting of 'Size of the affected population' (3.2 ± 1.1). Clinicians did not perceive this criterion to be very relevant since they tend to consider patients individually, while hospital pharmacists consider it an important criterion when calculating costs and estimating the budget impact of a treatment. From the patient's perspective, it is also an important criterion since it directly affects the visibility of the pathology.

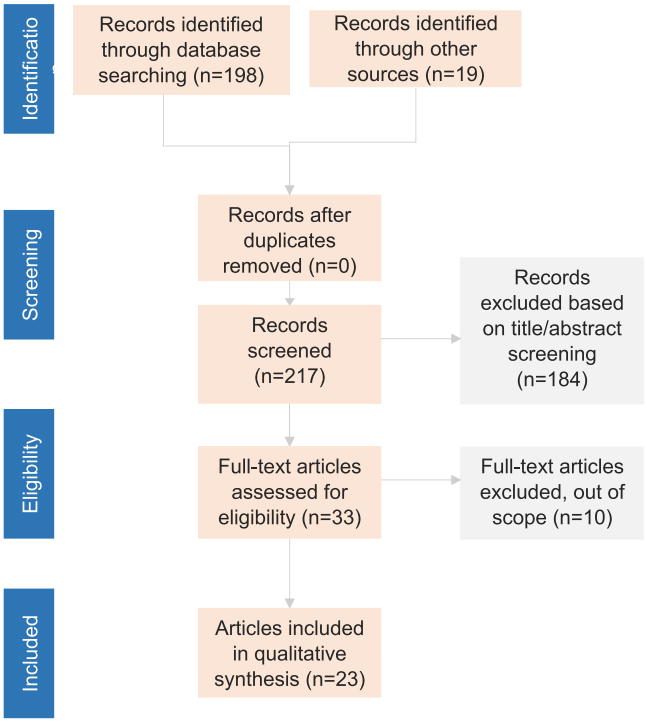

FIGURE 1 PRISMA flow diagram for the presentation of the targeted literature review results.

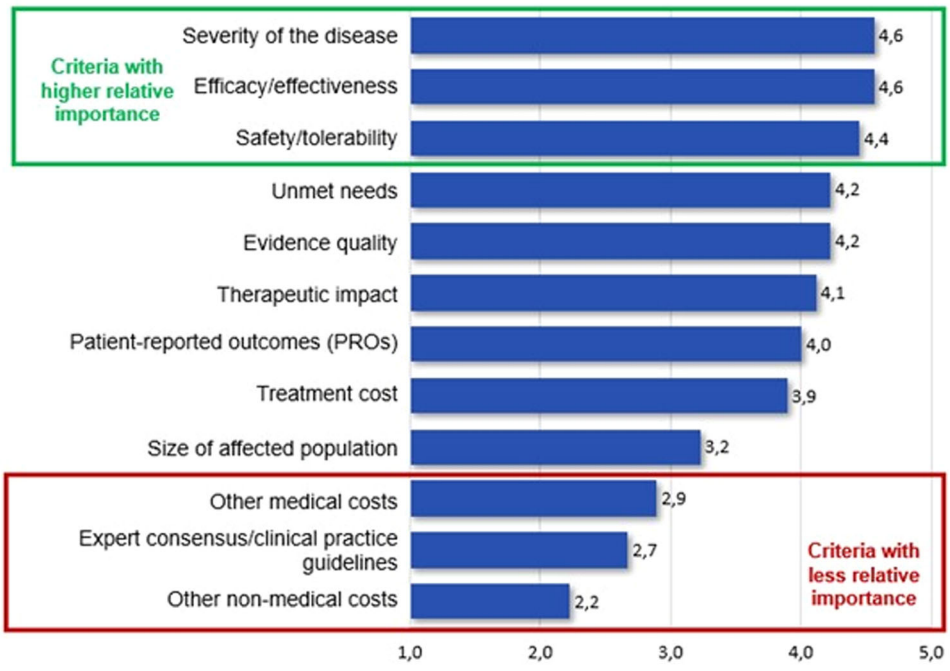

FIGURE 2 MCDA framework weighting results. The green panel indicates the results with the highest scores. The red panel indicates the results with the lowest scores. MCDA, Multi-Criteria Decision Analysis.

'Cost of treatment' (3.9 ± 0.8) was considered a relevant criterion since it has a direct impact on the sustainability of the health system.

'Other medical costs' (2.9 ± 0.8) and 'indirect costs' (2.2 ± 0.4) were considered less relevant, as participants perceived them as difficult to assess due to the lack of published evidence in most cases. 'Expert consensus and clinical practice guidelines' (2.7 ± 1.5) was one of the least valued criteria; however, participants indicated that the existence of guidelines can help in clinical practice.

Criteria scoring

Quantitative criteria

'Severity of the disease' received a score of 3.3 ± 0.7 (Figure 3). Participants agreed that PN is a severe disease, which, although not life-threatening, has a very negative impact on patients' quality of life. It is associated with important comorbidities, such as endocrine, cutaneous or cardiovascular diseases, and it is considered one of the most disabling dermatological diseases due to the intensity of pruritus. Participants commented that, currently, there are no agreed severity criteria for PN in published literature. Clinicians indicated that the number of lesions, itch severity and quality of life are three variables that should be considered to estimate the severity of PN.

'Size of affected population' scored 2.0 ± 0.7. Participants mentioned that due to the lack of a consensus definition for PN and the existing variability of epidemiological evidence, it is difficult to estimate the size of the affected population. However, clinicians agreed to consider PN as a subtype of chronic prurigo and pointed out that the prevalence reported in the literature that best represents Spain's current situation would be between 7.2 and 11.1/10,000 inhabitants.[4,5]

'Unmet needs' (4.2 ± 0.7) received the highest score, as PN was perceived to have many unmet medical needs, especially due to the unavailability of treatments with a specific indication for PN. Current treatments are not specific, have partial and time-limited efficacy and are not well tolerated in the long term.

Clinicians indicated that there is little awareness of PN among other specialists. However, they did not consider that there is a problem in the diagnosis and referral process; rather, due to the lack of effective treatments, patients eventually give up and leave the healthcare circuit. Clinicians also pointed out the lack of tools to assess the intensity and severity of PN, as well as specific questionnaires to assess patients' quality of life.

Experts considered that off-label treatments used in clinical practice have a limited 'efficacy/effectiveness' profile that is not sustained over time (1.8 ± 1.1). The patient flagged that none of the received treatments had been effective, especially in the long term.

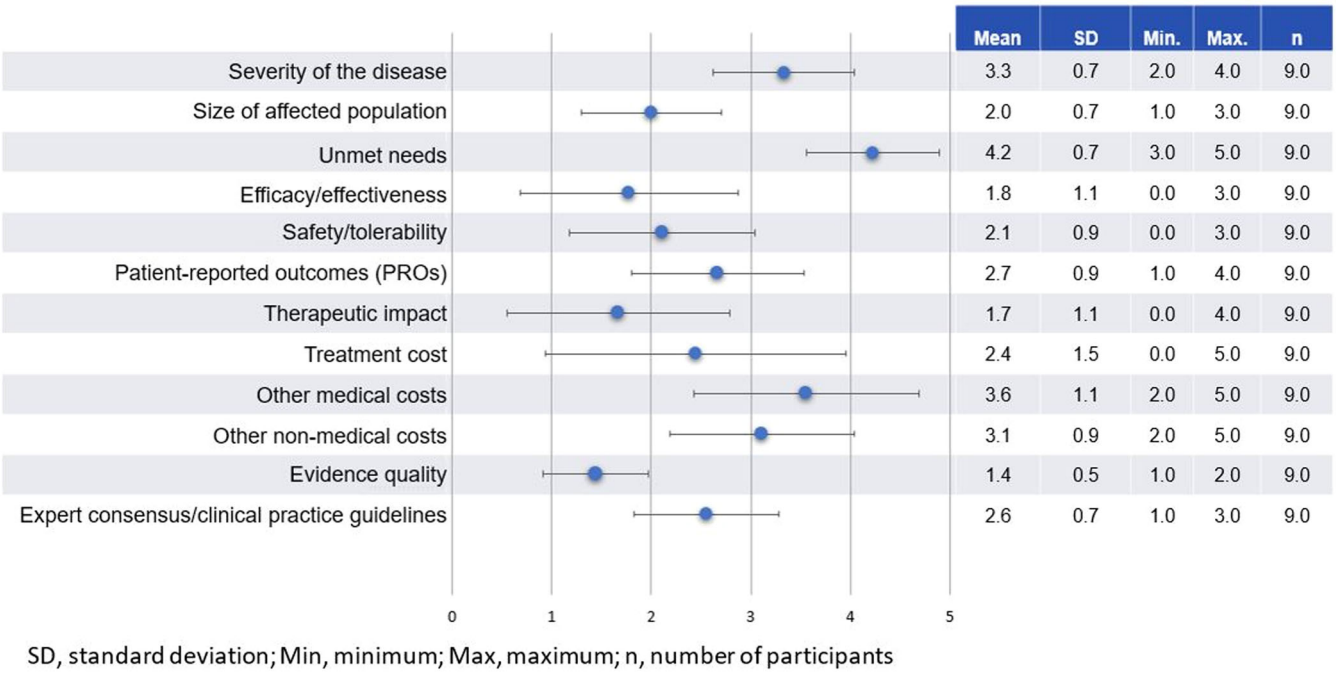

FIGURE 3 MCDA framework quantitative criteria for PN results. Scores are shown as mean, standard deviation (SD) and range of minimum and maximum. '*n*' is the number of answers. MCDA, Multi-Criteria Decision Analysis; PN, prurigo nodularis.

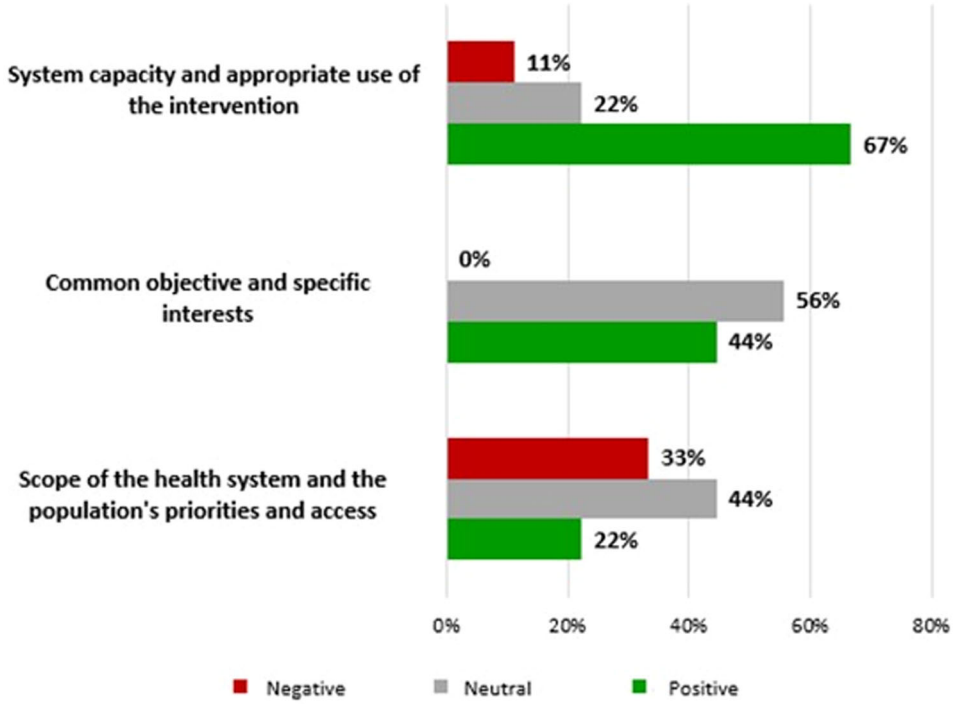

FIGURE 4 MCDA framework contextual criteria for PN results. Group scores are represented in this bar graph. Results in red show the % of negative votes, results in grey show the % of neutral votes and results in green show the % of positive votes. MCDA, Multi-Criteria Decision Analysis; PN, prurigo nodularis.

Participants perceived that the safety profile of currently available treatments is known and manageable in the short term; however, 'Safety/tolerability' scored 2.1 ± 0.9 due to the non-favourable long-term safety profile of current treatments.

'Patient-reported outcomes' scored 2.7 ± 0.9 because of the perceived high impact that PN has on patients' quality of life. Clinicians agreed that, in their clinical experience, most patients do not respond to current off-label treatments, resulting in no positive impact on their quality of life. Clinicians indicated that they do not use PROs questionnaires in clinical practice due to the lack of specific tools.

The 'Therapeutic impact' of available off-label pharmacological treatment is limited (1.7 ± 1.1). Participants considered that the available off-label treatments aim to treat the symptomatology, provide a partial therapeutic response, and do not modify the clinical course of the disease.

Although the cost of current off-label treatments was not considered to be high (2.4 ± 1.5), participants highlighted that PN is associated with moderately high 'Other medical costs' (3.6 ± 1.1), due to visits to different specialists and complementary examinations necessary for proper patient follow-up.

'Indirect costs' (3.1 ± 0.9) were perceived to be moderately high. All participants agreed that PN is a disease with relevant indirect costs that are not reflected in the available evidence. Patients bear a lot of costs, such as co-payments for prescribed treatments, visits to dermatologists in private centres, additional skin-care products, and special clothing.

Pharmacists mentioned that the co-payment and the costs borne by patients could affect adherence and consequently the effectiveness of treatment and quality of life of the patient.

Experts considered 'current expert consensus and clinical practice guidelines' (2.6 ± 0.7) to be unclear on the definition of severity of PN and treatment algorithm. In addition, the quality of evidence (1.4 ± 0.5) for currently used off-label treatments was perceived as low due to the lack of published randomised clinical trials.

Contextual criteria

'Scope of the healthcare system and population priorities and access' received different value perceptions: although most participants considered that PN does not stand as a key priority for the Spanish healthcare system, not being reflected within the objectives of healthcare strategies, 22% of participants considered that PN could be aligned with the

objectives of current healthcare strategies (33% negative, 44% neutral and 22% positive) (Figure 4).

Participants mentioned that, in general, no barriers to accessing a treatment for PN would be expected, but participants commented that social pressure would not be relevant due to the lack of a patient association in Spain ('Common objective and specific interests' 44% positive and 56% neutral).

All participants agreed that the National Health System (NHS) is well prepared and adapted for the introduction of a specific drug for the treatment of PN. However, clinicians demand the creation of multidisciplinary PN units in Spain for an efficient management and follow-up of patients, and more information to healthcare professionals, especially in primary care ('System capacity and appropriate use of the intervention' 67% positive, 22% neutral and 11% negative) (Figure 4).

Re-scoring

Participants changed the scores of some criteria, but the changes were not statistically significant. The criteria that changed the most were: 'Unmet needs' (+0.2) due to the lack of specific and effective treatments for PN and the lack of overall knowledge and evidence discussed during the session, 'Indirect costs' (+0.8), which changed after hearing the patient's personal experience during the discussion, 'Efficacy/effectiveness' (−0.3) and 'PROs' (−0.2) due to the clinical experience shared by the dermatologists and the patient, and 'Quality of evidence' of available off-label treatments (−0.3).

DISCUSSION

All participants considered PN to be a severe disease that is highly disabling due to severe itching and skin lesions. Currently, severity scales are based only on the number of lesions. However, according to the clinical experience provided by the participants, aspects such as quality of life, pruritus intensity, sleep impairment or PROs should be considered when assessing severity.

There is controversy in published evidence on whether PN is considered a rare disease (<5/10,000 population) or not. According to recent studies conducted in the United States (US) and Germany, the world's overall prevalence is estimated to be between 7.2 and 11.1/10,000 inhabitants,[4,5] while another study conducted in England estimates it to be 3.27/10,000 inhabitants.[6] Existing controversy is mainly due to a lack of an agreed definition of PN.

Although no epidemiological studies conducted in Spain have been identified, participants agreed to consider PN as a subtype of chronic prurigo and, thus, not consider PN a rare disease. Experts perceived PN to be uncommon and highlighted that the prevalence that would best reflect the current situation in Spain is in line with the US and German studies.

High importance has been given to the impact of PN on patients' quality of life: in addition to the perceived limited efficacy and long-term safety profile of available off-label treatments, PN generates a significant loss of opportunity in a person's life development (personal, academic and professional). Experts highlighted that PN is associated with work absenteeism and other intangible costs such as patients' ability to concentrate, and that the physical and psychological sequels of pruritus (scarring and constant itching) limit patients' social life.

Hospital pharmacists mentioned that it would be relevant for patients to report treatment outcomes in real clinical practice. Clinicians indicated that PRO questionnaires are not routinely used in clinical practice. Furthermore, they mentioned that there are no PN-specific questionnaires. Participants highlighted the growing importance of the use of PROs in dermatological diseases.

Clinicians considered that there is a need for specific tools to measure the severity and intensity of PN that take into account the specificities of the disease. However, there are validated tools for measuring the intensity of prurigo such as the Investigator's Global Assessment for prurigo and the Prurigo Activity Score, although these are not specific for PN and their use is variable in clinical practice.

Participants also agreed that there are important unmet needs, as none of the psychological, aesthetic, and physical needs of patients are covered by available off-label treatments. Results are in line with other published studies: the European Academy of Dermatology and Venerology (EADV) conducted a survey among EADV member clinicians to examine the perception of PN diagnosis and management. More than half of the interviewees perceived the need for new and effective therapies in the management of PN.[16]

Another European study reported that 63% of PN-treated patients are not satisfied (completely or partially) with their treatment, and that 29% consider that none of the therapeutic options are effective.[28] Currently, there are promising drugs being assessed which may facilitate the treatment of this disease.[2,10,29,30]

'Indirect costs' was the criterion that changed the most during the re-scoring after the group discussion, as health professionals had no visibility and no published data regarding the cost assumed by patients in Spain,

mainly due to associated comorbidities, visits to dermatologists in private centres and the need of special skincare products and special clothes that are not reimbursed by the NHS.

This study is not exempt from limitations: first, results are based on a panel composed of eight experts in the management, evaluation and decision-making in PN in Spain and one patient. Although the panel could be considered as relatively small, participants have been selected to ensure representativeness of all relevant profiles and a reduced group facilitates participation in live discussions and sharing of perspectives. The number of included participants is in line with recent studies that have used MCDA to help assess value across different medical conditions and therapeutic areas.[23,31–35] Second, the included information is limited by the information and data publicly available at the time of the study. Thus, results might change when new data becomes available.

Spanish evaluators and decision makers have already considered the use of MCDA as a complete and useful tool, feasible to be used for drug evaluation and decision-making. In recent years, there has been increased interest in MCDA and studies reflecting its use in Spain and elsewhere have highlighted its usefulness in healthcare evaluation and decision-making.[32,36]

The MCDA framework and the weighting obtained in this study could serve as a basis for a future analysis of the value provided by a new PN treatment, once available.

CONCLUSION

PN was considered a serious, disabling and infrequent disease, with important unmet needs, such as the lack of specific treatment. Current off-label alternatives have limited efficacy and an unfavourable long-term safety profile. Moreover, their use is based on low-quality evidence due to the lack of clinical trials. Although the cost of currently used treatments is not high, PN was associated with moderately high medical costs and indirect costs, due to associated comorbidities.

AUTHOR CONTRIBUTIONS

The authors confirm their contribution to the paper as follows: study conception and design: Juan Francisco Silvestre, M. A. Calleja and John Shepherd; draft manuscript preparation: Juan Francisco Silvestre and John Shepherd. All authors have contributed to the analysis and interpretation of the results, reviewed the results and approved the final version of the manuscript.

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CONFLICT OF INTEREST STATEMENT

Juan Francisco Silvestre Salvador has collaborated as a speaker, advisor and/or researcher for the following companies: AbbVie, Amgen, Astra Zeneca, Bristol Myers Squibb, Eli Lilly, Galderma, Incyte, Leo Pharma, Novartis, Pfizer, Regeneron y Sanofi Genzyme. The authors have received fees from Galderma for their participation in the study. None of the authors have received fees for the elaboration or review of the manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available upon reasonable request.

ETHICS STATEMENT

Not applicable.

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REFERENCES

1. Zeidler C, Tsianakas A, Pereira M, Ständer H, Yosipovitch G, Ständer S. Chronic prurigo of nodular type: a review. Acta Dermato Venereol. 2018;98(2):173–9.
2. Docampo-Simón A, Sánchez-Pujol MJ, Silvestre-Salvador JF. Prurigo crónico: actualización. Actas Dermosifiliogr. 2022;113:563–74.
3. Pereira MP, Steinke S, Zeidler C, Forner C, Riepe C, Augustin M, et al. European Academy of Dermatology and Venereology European prurigo project: expert consensus on the definition, classification and terminology of chronic prurigo. J Eur Acad Dermatol Venereol. 2018;32(32):1059–65.
4. Ständer S, Ketz M, Kossack N, Akumo D, Pignot M, Gabriel S, et al. Epidemiology of prurigo nodularis compared with psoriasis in Germany: a claims database analysis. Acta Derm Venereol. 2020;100(18):1–6. Available from: https://medicaljournalssweden.se/actadv/article/view/1831/3858
5. Huang AH, Canner JK, Khanna R, Kang S, Kwatra SG. Real-world prevalence of prurigo nodularis and burden of associated diseases. J Invest Dermatol. 2020;140(2):480–3.
6. Morgan CL, Thomas M, Ständer S, Jabbar-Lopez ZK, Piketty C, Gabriel S, et al. Epidemiology of prurigo nodularis in England: a retrospective database analysis. Br J Dermatol. 2022;187:188–95.

7. Iking A, Grundmann S, Chatzigeorgakidis E, Phan NQ, Klein D, Ständer S. Prurigo as a symptom of atopic and non-atopic diseases: aetiological survey in a consecutive cohort of 108 patients. J Eur Acad Dermatol Venereol. 2013;27(5):550–7.
8. Espiñeira Sicre J, Docampo Simón A, Silvestre Salvador JF. Prurigo crónico nodular: Estudio retrospectivo de 74 casos. Actas Dermosifiliogr. 2022;113(9):866–73. Available from: https://www.actasdermo.org/es-prurigo-cronico-nodular-estudio-retrospectivo-articulo-S0001731022004677
9. Williams KA, Huang AH, Belzberg M, Kwatra SG. Prurigo nodularis. J Am Acad Dermatol. 2020;83(6):1567–75. Available from: https://doi.org/10.1016/j.jaad.2020.04.182
10. Leis M, Fleming P, Lynde CW. Prurigo nodularis: review and emerging treatments. Skin Therapy Lett. 2021;26(3):5–8.
11. Aggarwal P, Choi J, Sutaria N, Roh YS, Wongvibulsin S, Williams KA, et al. Clinical characteristics and disease burden in prurigo nodularis. Clin Exp Dermatol. 2021;46(7):1277–84.
12. Artime E, Serra E, Mert C, Díaz-Cerezo S, Huete T, Hernández-Subirá I, et al. Real-world treatment patterns, resource use and costs in adult patients with atopic dermatitis receiving systemic treatment: derma-atopic study in Spain. Actas Dermosifiliogr. 2023;114(1):9–18.
13. Huang AH, Canner JK, Williams KA, Grossberg AL, Kwatra MM, Kwatra SG. Healthcare resource utilization and payer cost analysis of patients with prurigo nodularis. Br J Dermatol. 2020;183:182–4.
14. Whang KA, Kang S, Kwatra SG. Inpatient burden of prurigo nodularis in the United States. Medicines. 2019;6(3):88.
15. Whang KA, Gabriel S, Chavda R, Kwatra SG. Emergency department use by patients with prurigo nodularis in the United States. J Am Acad Dermatol. 2021;84(4):1138–40. Available from: https://doi.org/10.1016/j.jaad.2020.06.1002
16. Pereira MP, Basta S, Moore J, Ständer S. Prurigo nodularis: a physician survey to evaluate current perceptions of its classification, clinical experience and unmet need. J Eur Acad Dermatol Venereol. 2018;32(12):2224–9.
17. Ständer S, Pereira MP, Berger T, Zeidler C, Augustin M, Bobko S, et al. IFSI-guideline on chronic prurigo including prurigo nodularis. Itch. 2020;5(4):e42. Available from: https://journals.lww.com/itch/Fulltext/2020/10010/IFSI_guideline_on_chronic_prurigo_including.1.aspx
18. Zeidler C, Yosipovitch G, Ständer S. Prurigo nodularis and its management. Dermatol Clin. 2018;36(3):189–97.
19. Frølunde AS, Wiis MAK, Ben Abdallah H, Elsgaard S, Danielsen AK, Deleuran M, et al. Non-atopic chronic nodular prurigo (Prurigo Nodularis Hyde): a systematic review of best-evidenced treatment options. Dermatology. 2022;238:950–60.
20. Ständer HF, Elmariah S, Zeidler C, Spellman M, Ständer S. Diagnostic and treatment algorithm for chronic nodular prurigo. J Am Acad Dermatol. 2020;82(2):460–8.
21. Thokala P, Devlin N, Marsh K, Baltussen R, Boysen M, Kalo Z, et al. Multiple criteria decision analysis for health care decision making—an introduction: report 1 of the ISPOR MCDA Emerging Good Practices Task Force. Value Health. 2016;19(1):1–13.
22. Marsh K, Ijzerman M, Thokala P, Baltussen R, Boysen M, Kaló Z, et al. Multiple criteria decision analysis for health care decision making—emerging good practices: report 2 of the ISPOR MCDA Emerging Good Practices Task Force. Value Health. 2016;19(2):125–37.
23. Gilabert-Perramon A, Torrent-Farnell J, Catalan A, Prat A, Fontanet M, Puig-Peiró R, et al. Drug evaluation and decision making in Catalonia: development and validation of a methodological framework based on multi-criteria decision analysis (MCDA) for orphan drugs. Int J Technol Assess Health Care. 2017;33(1):111–20.
24. OSTEBA. Síntesis de información relevante de apoyo a los MCDA. Informes de Evaluación de Tecnologías Sanitarias [Internet]. Available from: https://www.euskadi.eus/gobierno-vasco/-/libro/sintesis-de-informacion-relevante-de-apoyo-a-los-mcda-analisis-de-decision-multicriterio-para-la-toma-de-decisiones-proyecto-metodologico/
25. Roldán ÚB, Badia X, Marcos-Rodríguez JA, De La Cruz-Merino L, Gómez-González J, Melcón-De Dios A, et al. Multi-criteria decision analysis as a decision-support tool for drug evaluation: A pilot study in a pharmacy and therapeutics committee setting. Int J Technol Assess Health Care. 2018;34:519–26.
26. Badia X, Gil A, Shepherd J. PHP169—MCDA EVIDEM reference value framework for drug evaluation and decision making in Spain. Value Health. 2018;21:S179. Available from: https://doi.org/10.1016/j.jval.2018.09.1063
27. Hutton B, Salanti G, Caldwell DM, Chaimani A, Schmid CH, Cameron C, et al. The PRISMA extension statement for reporting of systematic reviews incorporating network meta-analyses of health care interventions: checklist and explanations. Ann Intern Med. 2015;162(11):777–84.
28. Gründel S, Pereira M, Storck M, Osada N, Schneider G, Ständer S, et al. Analysis of 325 patients with chronic nodular prurigo: clinics, burden of disease and course of treatment. Acta Derm Venereol. 2020;100(16):adv00269.
29. Calugareanu A, Jachiet M, Tauber M, Nosbaum A, Aubin F, Misery L, et al. Effectiveness and safety of dupilumab for the treatment of prurigo nodularis in a French multicenter adult cohort of 16 patients. J Eur Acad Dermatol Venereol. 2020;34(2):e74–6.
30. Ständer S, Yosipovitch G, Lacour JP, Legat FJ, Paul C, Reich A, et al. Nemolizumab efficacy in prurigo nodularis: onset of action on itch and sleep disturbances. J Eur Acad Dermatology Venereol. 2022;36(10):1820–5.
31. Abad M, Camps C, Domenech-Climent N, López R, Moreno E, Poveda J, et al. Determinación de la aportación de valor de la inmunoterapia aplicada a la oncología en España mediante análisis de decisión multicriterio. Rev Española Econ La Salud. 2018;13:852–67.
32. Guarga L, Badia X, Obach M, Fontanet M, Prat A, Vallano A, et al. Implementing reflective multicriteria decision analysis (MCDA) to assess orphan drugs value in the Catalan Health Service (CatSalut). Orphanet J Rare Dis. 2019;14(1):157.
33. Roldán ÚB, Badia X, Marcos-Rodríguez JA, de la Cruz-Merino L, Gómez-González J, Melcón-de Dios A, et al. Multi-criteria decision analysis as a decision-support tool for drug evaluation: a pilot study in a pharmacy and therapeutics committee setting. Int J Technol Assess Health Care. 2018;34(5):519–26.
34. Casanova M, Mateos MV, Arriba FDE, Arnao M, Ocio EM, Oriol A, et al. Determination of the value contribution of belantamab mafodotin (Belamaf; BLENREP®) for the treatment of triple-class refractory multiple myeloma in Spain through reflective multi-criteria decision analysis. Rev Española Econ La Salud. 2021;16:58–69.

35. Álvarez-Román MT, Cuervo-Arango I, Pérez-Santamarina R, Poveda JL, Romero JA, Santamaría A, et al. Determining the value contribution of emicizumab (Hemlibra®) for the prophylaxis of haemophilia A with inhibitors in Spain by multi-criteria decision analysis. Glob Reg Heal Technol Assess Ital North Eur Spanish. 2019;6:1.
36. Badia X, Chugani D, Abad MR, Arias P, Guillén-Navarro E, Jarque I, et al. Development and validation of an MCDA framework for evaluation and decision-making of orphan drugs in Spain. Expert Opin Orphan Drugs. 2019;7(7–8):363–72. Available from: https://doi.org/10.1080/21678707.2019.1652163

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