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Need for individualized counseling regarding psoriasis systemic therapy in women of childbearing age: analysis of the PsoFem study at the University Medical Center Hamburg

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ABSTRACT

Background: For patients with moderate-to-severe psoriasis and current childbearing/pregnancy, the choice of therapy is limited.

Objectives: The present study compared the disease burden and treatment choices in women of childbearing age (WoCBA) with and without a current wish for pregnancy.

Methods: Female patients aged 18 to 45 years, with moderate-to-severe psoriasis vulgaris, were consecutively recruited. The patients reported on sociodemographic/reproductive characteristics and quality of life impairments. The physicians assessed disease severity, comorbidities, and current treatment(s). Both patients' and dermatologists' perceptions of shared decision-making for the current systemic treatment were surveyed.

Results: Participants were 145 WoCBA with psoriasis: 73 were pregnant or reported a desire to conceive (group CB+) and 72 reported no wish to have (more) children (group CB–). Patients without childbearing wishes were older and often had previous children; no significant differences in clinical features or quality of life impairments were found. A significantly higher proportion of patients in the CB+ group were prescribed tumor necrosis factor alpha blockers, particularly certolizumab pegol. This treatment option was associated with previous children and the desire to conceive, but not with disease variables. Family planning was more often discussed and considered in the clinical decision for the CB+ group, but patient-doctor agreement for shared decision-making was fair-to-moderate.

Limitations: The small sample size prevented comparative analyses between patients planning a pregnancy in the short- vs long-term future. In addition, specific variables related to the decision-making process for the current therapy need to be assessed and examined in more detail in further research.

Conclusion: For WoCBA with childbearing wishes, tumor necrosis factor alpha blockers were most frequently prescribed, in accordance with current guidelines/recommendations. Decision-making for continuing or changing systemic therapy during pregnancy must take into account medication specificities and the vulnerable stages in pregnancy, as well as the limited amount of pregnancy-compatible drugs.

Keywords: childbearing wish, psoriasis, systemic treatment, women of childbearing age

Introduction

The therapy of psoriasis or psoriatic arthritis has changed impressively in the last 2 decades, targeting the systemic inflammatory cascade and aiming treatment goals of cleared clinical

What is known about this subject in regard to women and their families?

- Options for systemic therapy of psoriasis in pregnancy are limited.
- Women with severe psoriasis need systemic therapy also during family planning and pregnancy.
- Shared decision-making between physician and woman is crucial for a comprehensive and consented therapy planning.

What is new from this article as messages for women and their families?

- Tumor necrosis factor alpha blockers are frequently prescribed in conception planning and pregnancy.
- Physicians do not necessarily address family planning in the discussion of therapy options.
- Physicians and patients perceive discussions regarding shared decision-making for family planning differently.

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symptoms, also in severe cases. In Germany, one-quarter of patients with moderate-to-severe psoriasis and the need for systemic therapy are women of childbearing age (WoCBA).[1] With approval and accessibility of a wide range of systemic medications, the question of treatment continuity and possibilities for systemic therapy in pregnancy came into focus. The choice of therapy must take family planning into account, including the wish to have children.[2]

For patients with moderate-to-severe psoriasis and current childbearing wishes or pregnancy, the spectrum of medications is limited.[3,4] Conventional medications such as methotrexate, acitretin, or fumaric acid esters are contraindicated, and especially in the case of the retinoid, have to regard an interval of up to 3 years between the last dose and conception to avoid teratotoxic effects.[5–7] The group of biologics is heterogeneous. Some biologics have the complete molecular structure of IgG antibodies and are, therefore, able to use the neonatal fragment crystallizable receptor for active transport through the placenta, with a peek in the third trimester. Conversely, other biologics have an incomplete IgG resemblance, for example, certolizumab pegol, lacking the Fc fragment as receptor binding site and, therefore, considered in pregnancy.[8–11] However, none of the biologics have explicit approval for pregnant women, despite national and international guidelines referring to safety data of exposed pregnancies with a lack of risk signals after exposure.[12–18] Randomized clinical trials for approval of medications generally exclude pregnant women from participation, and there is a lack of data for this patient group.

Altogether, this state of information and approvals leads to a certain incertitude of physicians in initiating or continuing systemic treatment, especially with biologics, for women with childbearing wishes. Therefore, WoCBA often experiences different therapy management and levels of information about their possibilities for systemic treatment. Additionally, the need to treat has to be counterbalanced against the risk to harm. This includes considerations about the impact of active inflammation on the pregnancy and possible adverse events of treatment regimens.

To select the most appropriate treatment option, shared decision-making (SDM) is of utmost importance. Within a patient-centered healthcare approach, SDM is a crucial process that involves collaboration between healthcare professionals and patients in making decisions about treatment plans, considering both the patient's values and preferences and the clinical evidence and professional expertise. This approach is essential as it enhances patient autonomy, fosters a sense of partnership between the healthcare provider and the patient, and leads to better health outcomes.[19,20] An improved patient compliance is one of the key advantages of SDM. When patients actively participate in decision-making, they are more likely to adhere to treatment plans, leading to better long-term outcomes.[21] Additionally, SDM allows for a more comprehensive understanding of the risks associated with different treatment options. Patients who are well-informed about potential risks are better equipped to make decisions in accordance with their personal values and priorities. Moreover, SDM expands the range of treatment options considered, ensuring that the chosen approach is not only clinically effective but also matching with the patient's preferences.[22] By reducing passive and undecided situations, SDM empowers patients to take an active role in their healthcare. Through this, it fosters a sense of control and engagement that positively impacts overall well-being.

The aim of the present study was to conduct a comparative survey of disease burden and systemic therapies, as well as indicators of SDM, in WoCBA, with and without current wish for pregnancy, in routine care at a university hospital center.

Materials and methods

Study design and participants

The "PsoFem study—Impact of psoriasis on patient needs, preferences, stigmatization, disfigurement, and self-esteem in young women at childbearing age (WoCBA): a contribution to differentiation in therapy" consisted of a cross-sectional observational survey of female patients at childbearing age, diagnosed with any type of psoriasis and candidates to systemic treatment under real-world conditions.

Patients were consecutively recruited between March 25, 2022 (first patient visit) and January 16, 2023 (last patient visit), at the Health Services Research in Dermatology and Nursing (IVDP), University Medical Center Hamburg-Eppendorf (UKE). All eligible patients were screened by their physicians and included in the study if they cumulatively met the following inclusion criteria: (a) female between 18 and 45 years of age; (b) diagnosis of moderate-to-severe psoriasis vulgaris; (c) able to follow the instructions of the study and to complete the questionnaires in the German language; and (d) having signed an informed consent form. Patients were excluded if they were older than 45 years, had early menopause (ie, before the age of 45), or presented any comorbid condition, including the presence of laboratory abnormalities, as participating in the study would place them at unacceptable risk.

For comparative purposes, the included patients were divided based on their current childbearing preferences: patients who did not wish to have (more) children (group CB–) and patients who were currently pregnant or reported a wish of getting pregnant, either in the next 12 months or in the long-term future (group CB+).

Ethical considerations and informed consent

The PsoFem study was approved by the Ethics Committee of the University Medical Center Hamburg-Eppendorf (Lokale Psychologische Ethikkommission am Zentrum für Psychosoziale Medizin [LPEK-0330, June 11, 2021]). The study was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2008, and followed the criteria for good scientific practice and the current legal requirements for data protection. Informed consent forms in written form were obtained from all participants included in the study.

Outcome measures

For each patient, the physicians completed a clinical questionnaire specifically developed for this study, assessing, for example, type of psoriasis, date of diagnosis, comorbidities, current (or last until the date of assessment) therapies, and indicators of SDM, as well as the following routine clinician- and patient-reported outcomes:

- Body surface area (BSA): provides a 0 to 100 % score of the BSA affected by redness, thickness, and scaling, considering BSA <3 as mild, BSA between 3 and 10 as moderate, and BSA >10 as severe psoriasis.[23]
- Psoriasis Area and Severity Index (PASI): combines the assessment of the severity of lesions (ie, erythema, induration, and desquamation) and the area affected (head, trunk, arms, and legs) and provides a single score ranging from 0 (minimum severity) to 72 (maximum severity), with PASI scores ≥10 considered as moderate to severe psoriasis.[24,25]
- Dermatology Life Quality Index (DLQI): patient-reported skin-generic quality of life (QoL) questionnaire comprising 10 items, to be answered in a 4-point Likert response scale from 0 ("not relevant"/"not at all") to 3 ("very much"). A total score (range 0-30) was computed, with higher scores indicating larger impairments.[26] For this study, the DLQI total score was retrieved from the patients' medical records, as it is part of the routine assessment in dermatology practice.

Table 1

Sociodemographic, sexual and reproductive characteristics of women of childbearing age with and without current wishes to have (more) children (group CB– vs. group CB+)

		CB– n = 72	CB+ n = 73	t/χ^2	*P*
Age (years), M±SD		36.44 ± 6.60	29.88 ± 5.69	6.43	**<.001**
Advanced maternal age, *n* (%)	<35 years	21 (29.2%)	57 (78.1%)	34.89	**<.001**
	≥35 years	51 (70.8%)	16 (21.9%)		
Regular sexual intercourse (yes), *n* (%)		53 (73.6%)	58 (79.5%)	0.72	.397
Previous children (yes), *n* (%)		43 (59.7%)	11 (15.1%)	31.79	**<.001**
Number of previous children, M±SD		1.07 ± 0.99	0.16 ± 0.41	7.21	**<.001**
Fertility problems (yes), *n* (%)		6 (8.3%)	5 (6.8%)	0.11	.735
Contraception, *n* (%)[a]	Very effective/effective	31 (43.1%)	32 (43.8%)	0.26	.872
	Moderately/less effective	14 (19.4%)	17 (23.3%)		
	None	25 (34.7%)	24 (32.9%)		

χ_2, chi-squared test; M, mean; *n*, sample size; *P*, significance (2-sided); SD, standard deviation; t, independent-samples *t* test.

[a]Very effective: 0-0.9 pregnancies per 100 women per year as commonly used (eg, implants or copper IUD); Effective: 1-9 pregnancies per 100 women per year as commonly used (eg, pill/mini-pill or contraceptive patch); Moderately effective: 10-19 pregnancies per 100 women per year as commonly used (eg, male condom or calendar method); Less effective: 20 or more pregnancies per 100 women per year as commonly used (eg, female condom).[29]

Statistically significant *P* values (≤.05) are marked in bold.

The patients provided information regarding their sociodemographic, sexual and reproductive characteristics (eg, age, regular sexual intercourse, previous children, fertility problems, and contraception), symptoms and burden of psoriasis (eg, anogenital involvement, 0-10 numeric rating scale assessing the intensity of itching), as well as their perception of SDM for the psoriasis treatment.

Statistical analyses

The statistical analyses were conducted with IBM SPSS Statistics (V.29; IBM Corp., Armonk, NY). The level of significance was set at $P \leq .05$. Missing data were not replaced and were excluded using the listwise deletion method for multivariable analyses.

Descriptive statistics (mean [M] and standard deviation [SD] for continuous variables; absolute [n] and relative frequencies [%] for categorical/nominal variables) were calculated. WoCBA with and without a wish to have (more) children were compared in terms of sociodemographic, sexual and reproductive characteristics, psoriasis clinical features, and current systemic treatment, using independent-sample *t* tests (continuous variables; eg, PASI) or χ^2 tests (for nominal or categorical variables; eg, having previous children).

A multivariable logistic regression model was examined to identify the patient's and the psoriasis' characteristics that were associated with the likelihood of being prescribed with tumor necrosis factor (TNF) alpha blockers. Variance inflation factors were examined to diagnose potential multicollinearity problems in the multivariable models. Variance inflation factors ≥2.5 were defined as an indicator for considerable collinearity.[27] The goodness-of-fit of the overall model was evaluated using the Hosmer-Lemeshow test, with low (and nonsignificant) values indicating a good fit to the data. The statistical significance of individual variables was evaluated by calculating the Wald statistic and the odds ratio (OR) with a 95% confidence interval (CI).

Patients' and physicians' perspectives regarding shared therapy goals, communication about childbearing preferences, and inclusion of childbearing preferences in treatment decisions were also compared between WoCBA with and without childbearing wishes, using χ^2 tests. In addition, patient-doctor agreement on the 3 indicators of SDM was calculated with Cohen's *k* coefficients, as a measure of inter-rater agreement, considering $k \leq 0$ = no agreement, *k* between 0.01 and 0.20 = slight, *k* between 0.21 and 0.40 = fair, *k* between 0.41 and 0.60 = moderate, *k* between 0.61 and 0.80 = substantial, and k between 0.81 and 1.00 = almost perfect agreement.[28]

Results

Sample characteristics

A total of 154 female patients of childbearing age were recruited, and 145 were retained for analysis after the exclusion of 1 patient because of age >45 years, 2 patients because of missing questionnaires, 2 patients because of missing values on childbearing preferences, and 4 patients because of early menopause. From 145 patients included, 72 reported no wishes for (more) children and were assigned to the CB– group; 3 patients were pregnant at the time of assessment and 70 patients expressed the wish to conceive, either in the next 12 months (n = 18), in the long-term future (n = 51), or without indicating a timeframe (n = 1), and thus being assigned to the CB+ group.

Table 1 presents the patients' sociodemographic, sexual, and reproductive characteristics comparatively for the groups with and without current childbearing wishes (CB– vs CB+). Comparative analysis showed that the CB– group on average was older and more participants were older than 35 years of age. In addition, significant differences between the groups were found with respect to previous children, with a significant portion of women without childbearing wishes as they already had children. Of the 72 women who stated that they did not want (more) children, 25 (34.7%) were not using any contraceptive method. Of these 25 women, 12 (16.7%) reported having regular sexual intercourse and no fertility problems, therefore with a high chance of getting pregnant.

There were no significant differences between the CB– and CB+ groups for most clinical characteristics (Table 2). The only exception to this was the higher portion of women with guttate psoriasis in the CB+ group. Disease severity, QoL impairments, comorbidities, or psoriasis lesions in the anogenital area were not significantly related to the desire/planning of pregnancy.

Treatment choices in women of childbearing age

For the current treatment (or last treatment until the date of assessment), significant differences were found for the portion of patients prescribed with TNF alpha blockers, and specifically,

Table 2

Clinical characteristics of women of childbearing age with and without current wishes to have (more) children (group CB– vs. group CB+).

		CB– *n* = 72	CB+ *n* = 73	t/χ^2	*P*
Diagnosis, *n* (%)	Plaque psoriasis	69 (95.8%)	67 (91.8%)	1.02	0.312
	Guttate psoriasis	3 (4.2%)	10 (13.7%)	4.04	**0.045**
	Pustular psoriasis	2 (2.8%)	1 (1.4%)	0.36	0.552
	Intertriginous psoriasis	8 (11.1%)	10 (13.7%)	0.22	0.637
	Psoriasis capitis	1 (1.4%)	2 (2.7%)	0.33	0.568
	Psoriasis arthritis	13 (18.1%)	8 (11.0%)	1.39	0.238
Anogenital involvement (yes), *n* (%)		19 (26.4%)	19 (26.0%)	0.003	0.960
Intensity of itching (0-10 NRS), M ± SD		2.80 ± 2.79	2.56 ± 2.64	0.53	0.597
Disease duration (years), M ± SD		16.43 ± 10.24	13.44 ± 8.26	1.91	0.058
%BSA, M ± SD		3.44 ± 7.82	2.27 ± 6.70	0.97	0.336
PASI, M ± SD		1.97 ± 3.29	1.46 ± 3.31	0.94	0.350
Severe psoriasis (PASI >10), *n* (%)		3 (4.2%)	3 (4.1%)	0.00	0.986
DLQI, M ± SD		4.96 ± 6.50	3.52 ± 4.79	1.52	0.131
Large QoL impairments (DLQI > 10), *n* (%)		13 (18.1%)	7 (9.6%)	2.19	0.139
Comorbidities, *n* (%)	None	39 (54.2%)	42 (57.5%)	3.67	0.160
	1	17 (23.6%)	23 (31.5%)		
	2 or more	16 (22.2%)	8 (11.0%)		

χ_2, chi-squared test; BSA, body surface area; DLQI, Dermatology Life Quality Index; M, mean; *n*, sample size; NRS, numeric rating scale; *P*, significance (2-sided); PASI, Psoriasis Area and Severity Index; SD, standard deviation; t, independent-samples *t* test.
Statistically significant *P* values (≤.05) are marked in bold.

certolizumab pegol, with a higher portion of patients in the CB+ group (Table 3). On the contrary, the group CB– more often was prescribed with other nonbiologic systemic treatments, for example, fumaric acid esters. None of the patients were prescribed retinoids. The 2 patients in the CB+ group that were using methotrexate, reported the wish of having children in the future (in a year at the earliest) and were using at least moderately effective contraception (ie, pill or condom). Of the 5 patients prescribed methotrexate in the CB– group, only 1 reported regular sexual intercourse without contraception and no fertility problems, therefore running a high risk of pregnancy. Nevertheless, there is a noteworthy portion of patients prescribed drugs that have contraindications during pregnancy/lactation, independently of the patients' childbearing wishes.

Table 3

Current systemic treatment of women of childbearing age with and without current wishes to have (more) children (group CB– vs. group CB+)

	CB– *n* = 72	CB+ *n* = 73	χ^2	*P*
TNF alpha blocker, *n* (%)	12 (16.7%)	23 (31.5%)	4.36	**.037**
Adalimumab	6 (8.3%)	7 (9.6%)	0.07	.791
Certolizumab	5 (6.9%)	16 (21.9%)	6.56	**.010**
Etanercept	0 (0.0%)	0 (0.0%)	-	-
Golimumab	0 (0.0%)	0 (0.0%)	-	-
Infliximab	1 (1.4%)	0 (0.0%)	1.02	.312
IL12/23 or IL23 blocker, *n* (%)	28 (38.9%)	27 (37.0%)	0.06	.813
Guselkumab	9 (12.5%)	10 (13.7%)	0.05	.831
Risankizumab	3 (4.2%)	5 (6.8%)	0.50	.479
Tildrakizumab	5 (6.9%)	2 (2.7%)	1.40	.238
Ustekinumab	11 (15.3%)	10 (13.7%)	0.07	.787
IL17 blocker, *n* (%)	19 (26.4%)	13 (17.8%)	1.55	.213
Bimekizumab	1 (1.4%)	0 (0.0%)	1.02	.312
Brodalumab	1 (1.4%)	1 (1.4%)	0.00	.992
Ixekizumab	8 (11.1%)	4 (5.5%)	1.51	.218
Secukinumab	9 (12.5%)	8 (11.0%)	0.08	.773
JAK inhibitor, *n* (%)	0 (0.0%)	1 (1.4%)	0.99	.319
Upadacitinib	0 (0.0%)	1 (1.4%)	0.99	.319
Tofacitinib	0 (0.0%)	0 (0.0%)	-	-
Other non-biologic systemic treatment, *n* (%)	13 (18.1%)	5 (6.8%)	4.19	**.041**
Apremilast	1 (1.4%)	1 (1.4%)	0.00	.992
Ciclosporine	0 (0.0%)	0 (0.0%)	-	-
Fumaric acid esters	7 (9.7%)	2 (2.7%)	3.04	.081
Retinoid (acitretin)	0 (0.0%)	0 (0.0%)	-	-
Methotrexate	5 (6.9%)	2 (2.7%)	1.40	.238
No systemic treatment, *n* (%)	3 (4.2%)	5 (6.8%)	0.50	.479

χ^2, chi-squared test; IL, interleukin; JAK, janus kinase; *n*, sample size; *P*, significance (2-sided); TNF, tumor necrosis factor.
Statistically significant *P* values (≤.05) are marked in bold.

Table 4

Regression analysis explaining the clinical decision for TNF alpha blockers

	B (SE)	Wald	*P*	OR (95% CI)	VIF
Advanced maternal age[a]	−0.21 (0.55)	0.14	.708	0.81 (0.28-2.39)	1.52
Previous children[b]	1.59 (0.60)	6.98	**.008**	**4.92 (1.51-16.07)**	**1.49**
Childbearing wish[b]	1.74 (0.64)	7.44	**.006**	**5.69 (1.63-19.82)**	**1.51**
Regular sexual intercourse[b]	0.26 (0.55)	0.22	.642	1.29 (0.44-3.80)	1.04
Anogenital involvement[b]	0.25 (0.57)	0.19	.661	1.28 (0.42-3.91)	1.23
Intensity of itching	−0.06 (0.11)	0.28	.599	0.94 (0.76-1.17)	1.75
Disease duration (in years)	0.01 (0.03)	0.33	.568	1.01 (0.97-1.07)	1.19
PASI	0.04 (0.13)	0.09	.771	1.04 (0.81-1.32)	2.13
DLQI	−0.02 (0.07)	0.11	.741	0.98 (0.86-1.11)	2.26
Comorbidities[b]	−0.10 (0.45)	0.05	.832	0.91 (0.38-2.20)	1.11
Constant	−2.97 (0.90)	10.92	<.001	0.05	

B, unstandardized coefficient; CI, confidence interval; DLQI, Dermatology Life Quality Index; OR, odds ratio; PASI, Psoriasis Area and Severity Index; SE, standard error; TNF, tumor necrosis factor; VIF, variance inflation factor.

Statistically significant *P* values (≤ .05) are marked in bold.

[a]0 = <35 years, 1 = ≥35 years.

[b]0 = no, 1 = yes.

The results of logistic regression analysis testing the associations between patient and disease characteristics and the likelihood of treatment choice for TNF alpha blockers in WoCBA are displayed in Table 4. The multivariable logistic regression model was significant, $\chi^2_{(10)} = 18.13$, $P = .053$, and explained approximately 12.4% (Cox and Snell R^2)-18.5% (Nagelkerke R^2) of the variation in the prescription of TNF alpha blockers. The results of the Hosmer-Lemeshow's goodness-of-fit test indicated that the multivariable model fit the data well, $\chi^2_{(8)} = 2.84$, $P = .944$. The treatment option for TNF alpha blockers in WoCBA was associated with having had children previously and the desire to have (more) children. Clinical characteristics were not associated with the prescription of TNF alpha blockers in the current sample.

Shared clinical decision-making for the current psoriasis treatment

Regarding the indicators of SDM for the current treatment (Table 5), the physicians reported that treatment goals were set together with all patients, while less than 50% of the patients acknowledged the shared therapy goals, with no significant differences between the CB+ and CB– groups. Family planning, that is, the wish to have (more) children, was more often discussed between doctors and patients who wish to get pregnant (group CB+); however, the doctors reported a higher frequency of family planning discussion than the patients, with a moderate level of patient-doctor agreement ($k = 0.43$). Regarding the consideration of the childbearing wishes in the clinical decision, no significant differences between the groups were found for physicians' reports, but more patients in the CB+ group reported that their childbearing wishes were taken into account in the treatment decision. The rate of patient-doctor agreement was fair ($k = 0.22$).

Discussion

The comparative analyses of patient and disease characteristics showed that women with current childbearing wishes were, on average, younger and more often had no previous children, compared with the group without childbearing wishes. However, this does not rule out pregnancy intentions in women in the age group considered for risk pregnancies (age >35 years) and with previous children. In addition, unintended pregnancies have been reported by 16.8% of women between the ages of 20 and 44 years in Germany,[30] and cannot be ignored. Therefore, all WoCBA should receive information about treatment options before and after conception.

There were no significant differences between the groups for reproductive and psoriasis-related variables, which show that severe psoriasis (PASI >10), large QoL impairments (DLQI >10), comorbidities, or even the presence of anogenital lesions did not result in patients' resignation from childbearing. The absence of differences between the groups with and without childbearing wishes regarding the portion of WoCBA that have regular sexual intercourse but do not use any (or use less effective) contraceptive methods is also worth discussing. This observation raises concern about treatment decisions that are contraindicated in pregnancy, based on the patient's manifested wish of not having (more) children. The physicians need to complement the discussion of family planning with a detailed inquiry about risk behaviors that might result in unintended pregnancy to inform the clinical decision and to indicate the realistic chance of a spontaneous and unintended pregnancy.[31]

Psoriasis has its etiology in an interplay of immunological processes with systemic significance, often together with comorbidities.[32–36] During pregnancy, complex immunological changes occur. Specifically, the immune system of a pregnant woman follows a finely tuned plan, which initially aims to avoid the recognition and rejection of the fetal part as foreign to the body and, at the end of the pregnancy, initiates birth.[37] This has a significant impact on the skin disease and a definite prognosis cannot be predicted.[38–40] Therefore, systemic treatment for moderate-to-severe psoriasis should not be stopped automatically in the case of conception and needs to be thoroughly planned with the patient.[41,42] Furthermore, the inflammatory activity needs to be kept low during pregnancy to avoid the possible impact of systemic inflammation on the growing fetus.[43–49] In accordance, the study results showed a majority of WoCBA receiving biologic treatment. Following current guidelines and recommendations,[3,4,10,11,50] TNF alpha blockers, namely certolizumab pegol, were prescribed more frequently to women with an expressed desire to conceive. The long-term experience with TNF alpha blockers as the first biologics with approvals for psoriasis provides more scientific evidence and collected data for exposed pregnancies than for the latest interleukin-23 inhibitors.

In addition, the treatment option for TNF alpha blockers was associated with having had children previously and the desire of having (more) children. On the contrary, there were no associations between the prescription of TNF alpha blockers and disease characteristics, for example, disease severity, QoL impairments, or presence of psoriasis lesions in the anogenital area. These results suggest that family planning is, at least partially, being considered in the clinical decision. Considerations for initiating or changing systemic therapy during pregnancy need to consider the specificities of medication regarding exposure of both mother

Table 5

Shared decision-making for the current treatment of women of childbearing age with and without current wishes to have (more) children (group CB– vs. group CB+)

	Informant	No childbearing wish (CB–) n = 72	Childbearing wish (CB+) n = 73	χ^2	*P*	Patient-doctor agreement (k)
Shared therapy goals, *n* (%)[a]	Doctor	67 (93.1%)	70 (95.9%)	-ǂ	-ǂ	-ǂ
	Patient	31 (43.1%)	31 (42.5%)	0.10	.753	
Communication about childbearing preferences, *n* (%)[b]	Doctor	29 (40.3%)	43 (58.9%)	5.03	**.025**	0.43
	Patient	13 (18.1%)	30 (41.1%)	8.47	**.004**	**(*P* < .001)**
Childbearing preferences taken into account in clinical decision, *n* (%)[c]	Doctor	31 (43.1%)	39 (53.4%)	1.56	.212	0.22
	Patient	23 (31.9%)	42 (57.5%)	9.37	**.002**	**(*P* = .011)**

[a]Do you set the therapy goals together with the patient? (0 = no; 1 = yes)/Do you set the therapy goals together with your doctor? (0 = no; 1 = yes).

[b]Has the patient ever expressed her desire to have children? (0 = never; 1 = yes, in previous pregnancy(s)/yes, she is currently pregnant/yes, she wants/plans to get pregnant soon)/Have you ever mentioned your desire to have children to your doctor? (0 = never; 1 = yes, in previous pregnancy(s)/yes, I am currently pregnant/yes, I wish/plan to get pregnant soon).

[c]Was the patient's desire to have children taken into account in the current treatment choice? (0 = no; 1 = yes)/Were your wishes about having children taken into account when choosing the treatment? (0 = not at all/barely/partly; 1 = quite/completely).

ǂNo statistics are computed because the valid % for both groups is 100% (variable is a constant), with 6.9% and 4.1% of missing responses.

n, sample size; χ^2, chi-squared test; *P*, asymptotic significance (2-sided); k, Cohen's k coefficient (k ≤ 0 = no agreement, k between 0.01 and 0.20 = slight, k between 0.21 and 0.40 = fair, k between 0.41 and 0.60 = moderate, k between 0.61 and 0.80 = substantial, and k between 0.81 and 1.00 = almost perfect agreement).[28]

Statistically significant *P* values (≤ .05) are marked in bold.

and child. Moreover, treatment choices must take into account the vulnerable stages in pregnancy, for example, the first trimester in which a high rate of spontaneous abortions can occur, independent of medications or detectable reasons.

Another interesting result relates to the percentage of physicians and patients who report a shared clinical decision. While the physicians claimed to have established therapy goals together with all patients, this view was acknowledged by less than half of the patients. On the one hand, this might reflect different perceptions of information during medical appointments, which is especially important when it comes to information about risks and therapy management. On the other hand, about half of the physicians admitted that family planning was not discussed with the patients, particularly those without childbearing wishes and that the childbearing wishes of the patients were not considered in the clinical decision. This data shows that, even if the physicians set therapy goals regularly with the patients, they did not necessarily address family planning, as previously described in the literature.[51] Further studies are necessary to ascertain who introduces family planning in the discussion about treatment options, as this topic seems to be frequently neglected by physicians in routine care.

Study limitations

Study limitations include the small sample size and the uneven distribution of patients within the CB+ group which prevented the comparison of patients who are planning a pregnancy for the next 12 months and those who wish a child in the long-term future. The time of pregnancy planning might play a very important role in the treatment decisions and in the patient-doctor communication about family planning. WoCBA with long-term childbearing wishes are likely to postpone the consideration of implications of the disease and its treatments; therefore, they might be comparable to WoCBA without childbearing wishes, thus hiding the differences between the groups CB+ and CB–. Another study limitation was the use of a different response scale for patients and physicians to assess the consideration of the childbearing wishes in the clinical decision: while physicians answered in a yes/no scale, patients used a 5-point Likert scale, with the additional option of "did not apply to me," that was later dichotomized. This discrepancy might have influenced the rates of patient-doctor agreement in this particular variable. A third limitation is the absence of more specific information related to the decision-making process for the current therapy, for instance, information on who initiated the discussion about family planning (the doctor or the patient), from where patients got the information about the treatment options (eg, from the physician, from the internet, or brochures), how long the patients were exposed to the current treatment and on recent medication changes because of family planning issues. The study did not indicate how many patients rejected systemic therapy after discussing therapy options, benefits, and risks in pregnancy.

Conclusion and future directions

Family planning should be addressed in the clinical decision-making process the earliest possible, to design an individualized therapy plan fitting to the patients' childbearing wishes. With current treatment options, it should be possible for every woman to fulfill their desire to have a child, independently of their skin condition and its severity. The discussion of treatment options that are pregnancy-compatible is extremely important to reduce patients' uncertainties and misunderstandings, as well as their adherence to the therapeutic plan in case of pregnancy. Further research addressing these issues in WoCBA with other autoimmune skin conditions, such as hidradenitis suppurativa, atopic dermatitis, or lupus, is necessary since systemic therapies are also the preferred treatment choice with severe and active inflammation.

Conflicts of interest

The authors made the following disclosures: B.S., M.A., and N.G. participated in clinical trials and received honorary fees and financial support for scientific lectures and presentations at national and international congresses from the sponsor of the study as well as other pharmaceutical companies. Other authors declare no conflicts of interest.

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Study approval

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Author contributions

NdS: Contributed to the study conceptualization, data curation, formal analysis, discussion of results, and writing of the initial draft of the manuscript. BST contributed to the study conceptualization, analysis, interpretation and discussion of results, and writing of the initial draft of the manuscript. MA and RS: Contributed to the study conceptualization, funding acquisition, project administration and supervision, discussion of results, and critical review and editing of the manuscript. All authors reviewed the final version of the manuscript, approved it for submission, and agreed to take public responsibility for its content.

Patient consent

Informed Consent Forms (ICF) in written format were obtained from all individual participants in the study.

Data availability

Data and other materials are available upon request from the corresponding author.

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