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Review

Systemic Sclerosis in Women—Impact on Sexuality, Fertility, Pregnancy, and Menopause

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Abstract

Background: Systemic sclerosis is a systemic autoimmune disease that also impacts women's health in very different ways. Methods: This review summarises the most important data on sexuality, fertility, pregnancy, and menopause from the last 10 years. Findings: We identified nine articles with data on sexuality and a prevalence of sexual dysfunction varying between 46 and 90%. Fertility was examined in six studies, with evidence for a negative influence at least on ovarian reserve. With regard to menopause, only three studies are mentioned that show an increased risk for premature menopause in SSc women. Although pregnancies are rare in SSc women after disease onset, there is growing evidence that pregnancies are feasible but go along with a higher maternal and foetal risk compared to healthy controls. Interpretation: SSc is dominated by female gender, but aspects of women's health influenced by the disease are still often ignored. The treating physician should be aware of the mostly negative impact on sexuality, fertility, and pregnancy and address these topics with the patients to adapt treatment and follow-up examinations to the patients' complaints and life situation.

Keywords: women; systemic sclerosis; sexuality; fertility; pregnancy; menopause

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1. Background

Systemic sclerosis (SSc) is a chronic autoimmune disease characterised by fibrosis of the skin and internal organs [1]. The estimated global prevalence of SSc is 17.6–18.9 per 100,000 individuals, with 28.0–31.2/100,000 females and 6.0–6.8/100,000 males [2]. The manifestations of the disease can vary significantly, often impacting the vascular system, lungs, kidneys, gastrointestinal tract, and musculoskeletal system. SSc in most cases starts with vasculopathy leading to Raynaud's phenomenon with trophical damage like digital ulcers that can lead to severe infections and the loss of parts of the fingers. The skin thickening usually starts at the fingers/hand and feet but can affect the whole body and especially the face, leading to a reduction in movement and changes in the patient's look. For organ manifestations, inflammatory changes in the lung and heart lead to deterioration of the organ function by progressive lung fibrosis or myocardial fibrosis, which is the most common reason for mortality in these patients [1,3]. The whole gastrointestinal tract can be affected, with motility disturbance of the oesophagus being the most frequent manifestation. One of the most severe complications in SSc is scleroderma renal crisis (SRC), which is associated with high morbidity and mortality. It is a rare manifestation

and usually manifests in the first years after diagnosis [1]. The extent of the skin fibrosis defines the differentiation between limited (lc) and diffuse cutaneous (dc)SSc and thus their prognosis, although the autoantibody status plays an even more important role [1]. Patients with antibodies against centromes have more often an lcSSc and a better prognosis than patients with antibodies against topoisomerase I or RNA polymerase III [3].

Systemic sclerosis affects women's health in very different ways. Vaginal dryness and atrophy have a negative impact on sexuality and desire, fertility and pregnancy are negatively affected by systemic sclerosis, and patients appear to go into menopause earlier. However, although more women than men are affected by the disease, there is very little research on the topic of women's health. Here we tried to summarise the few data from the last 10 years.

2. Methods

A PubMed search over the last 10 years was carried out using the search terms "systemic sclerosis and sexuality", "systemic sclerosis and fertility", "systemic sclerosis and pregnancy", and "systemic sclerosis and menopause". Inclusion criteria were the diagnosis of SSc independent of lcSSc or dcSSc. Only data on adult women were taken into consideration. Case reports were excluded.

For the search term "systemic sclerosis and sexuality", 50 papers were identified, of which 9 were suitable. For "systemic sclerosis and fertility", 6 out of 25 publications, for "systemic sclerosis and pregnancy" 19/140, and for "systemic sclerosis and menopause", only 3/29 articles were considered.

3. Results

3.1. SSc and Sexuality

Sexual dysfunction (SDF) has been reported frequently among individuals diagnosed with SSc, largely due to physical and emotional factors. SSc is known to cause vascular abnormalities, which can also lead to reduced perfusion of the genitals [4]. This may contribute to erectile dysfunction in men and vaginal dryness or dyspareunia in women. Thickening of the skin can extend to the genital area, potentially causing discomfort or reduced sensation during sexual activity. Furthermore, fibrosis in vaginal tissue may result in vaginal atrophy, contributing to painful intercourse. Joint stiffness or pain due to musculoskeletal involvement may render sexual activity physically challenging or uncomfortable, especially when finger movement is reduced due to contractures. SSc has also been demonstrated to result in neuropathy, manifesting as a reduction in sensitivity or an alteration in sexual response in some patients. The chronic nature of SSc, in conjunction with its overt physical manifestations, has the potential to engender feelings of anxiety and body image concerns, all of which can significantly impact sexual desire and intimacy. Patients experience feelings of self-consciousness or fear regarding their ability to engage in sexual activity, or they may experience a lack of desire due to emotional distress. The impact of the disease on depression affects nearly half of SSc patients, exacerbating sexual dysfunction [5,6]. Furthermore, emotional distress associated with body image changes also plays a significant role in one's sense of identity, especially concerning femininity, and this can also affect sexual functioning. The presence of fatigue, a common complaint in SSc, can further impair sexuality.

There are a number of approaches to the investigation of SDF. The most commonly used is the validated Female Sexual Dysfunction Index (FSFI) [7]. The FSFI comprises a series of questions designed to assess various domains of sexual function, including desire, arousal, lubrication, orgasm, satisfaction, and pain. The scale consists of 19 items, some of which address particularly intimate subjects; consequently, the questionnaire is completed

independently and without guidance from a physician. Other questionnaires, such as the shorter Qualisex questionnaire, which has been developed for rheumatoid arthritis (RA), have also been used in SSc [8]. In the context of measuring depression, the Beck Depression Inventory (BDI) is a frequently employed instrument, comprising 21 questions designed to assess symptoms of depression [9].

Several surveys of affected patients with SSc have been carried out, sometimes with comparisons to other connective tissue diseases, sometimes also with comparisons to healthy controls. In most cases, the cut-off of the FSFI questionnaire was <26.55 as recommended in the original publication [7], whereas some studies also used a stricter cut-off of <19, meaning that the data cannot be fully compared. Nevertheless, the prevalence of SDF is high and varies between 46.7% [4] and 90.7% [6] with differences in included patients. Age plays an important role when comparing these data, but also other differences in inclusion criteria influence sexual activity leading to large variety of SDF of 53% and 100%. The largest and latest study so far had the highest age and proportion of postmenopausal women but not the highest prevalence of SDF [10]. The highest prevalence of SDF, with around 90%, was found in two studies from Turkey and Italy, although the number of postmenopausal women was much lower, indicating the various influencing factors [6,11]. A study from Germany compared patients with SSc to an age-matched cohort of SLE patients and found no difference between the two groups with regard to SDF [5].

In summary, the prevalence of SDF in SSc women is high and significantly higher when compared to healthy controls [4,12,13]. Vaginal dryness is reported to be a major problem in these patients [5,11,13].

Table 1 provides an overview of recent publications on female sexual function in SSc.

Table 1. Most recent publications on female sexual function in SSc; abbreviations: BDI = Beck's depression inventory, SDF = sexual dysfunction; FSFI = female sexual function index; NK = not known.

Article	N	Mean or Median Age in Years	Mean or Median Disease Duration	% of Menopausal Women	Sexually Active	Prevalence of Vaginal Dryness	Prevalence of Dyspareunia	Prevalence of SDF FSFI	Prevalence of Depression According BDI
Lazzaroni M et al. [10]; 2025; Italy	168	58 (44–67)	9.0 (5–11)	70.2%	NK	NK	NK	66.2%	NK
Marcoccia A et al. [14]; 2024; Italy	65	44.71 (+/−11.96)	4.6 (+/−2.7)	NK	NK	NK	NK	Mean FSFI 15.85 not mentioning the %	NK
Dag A et al. [6]; 2024; Turkey	50	44.9 (+/−8.7)	10.1 (+/−5.8)	34%	NK	NK	NK	90%	60%
Ruffolo AF et al. [11]; 2023; Italy	107	53.47 (+/−13.27)	12.48 (+/−10.28)	54.2%	90.7%	83.2%	82.2%	89.7%	NK
Heřmánková B et al. [12]; 2022, Czech Republic	90	49.1 (+/−11.6)	4.0 (2–8)	56%	69%	NK	NK	73%	NK
Schmalzing M et al. [5]; 2020; Germany	83	48.5 (+/−11.07	9.85 (+/−8.4)	NK	62.6%	43.3	28.9%	49%	53%
Gigante A et al. [4]; 2019, Italy	15	41 (35–47)	9 (8–11)	0%	NK	NK	NK	46.7% (cut-off <19)	NK
Ucar I et al. [13]; 2018, Turkey	30	45.3 (+/−9.22)	NK	0%	100%	63.3%	23.3%	86.6%	NK
Sanchez K et al. [15]; 2016, France	60	55.9 (+/−14.0)	8.6 (+/−7.7)	NK	53.2%	NK	NK	62.5%	NK

3.2. SSc and Fertility

The impact of SSc on fertility may be influenced by both the disease itself and the therapeutic interventions employed to manage the condition. A significant proportion of women diagnosed with SSc report menstrual irregularities, including oligomenorrhea (infrequent menstrual cycles), amenorrhea (absence of menstruation), and preterm menopause. Several data on premature ovarian insufficiency (POI) and its correlation with immune cell dysfunction underline the link between autoimmune diseases and the female hormonal status as autoimmune diseases, especially thyroiditis, autoimmune polyglandular syndromes, hypophysitis, thrombocytopenia purpura, RA, systemic lupus erythematosus (SLE), primary biliary cholangitis, and diabetes are more common in patients with POI [16,17]. Differences in hormone levels during the female reproductive life, such as menarche, pregnancy, or menopause, may also influence disease activity [18,19].

Most of the studies on fertility are quite old and might reflect the concerns of both physicians and patients with regard to pregnancy and pregnancy complications after disease onset. Nevertheless, the trials suggest that infertility could be a feature of SSc [20,21]. Today there is some evidence that SSc can affect ovarian function, leading to premature ovarian failure or reduced ovarian reserve. This may result from the direct effects of the disease on the ovaries or the use of immunosuppressive drugs that may have a toxic effect on the ovaries. Two studies addressed this point but included different types of patients. The most recent paper included only patients younger than 40 years without cyclophosphamide (CYC) pretreatment and compared AMH and number of children to a healthy control group [22], whereas the paper from Thailand also allowed pretreatment with CYC [23]. Both groups found a high prevalence of low ovarian reserve, underlining the negative impact of SSc on ovarian reserve and thus fertility. The most recent studies found a very low number of pregnancies in India, with a rate of infertility of 8.3% [24], but no significant differences with regard to fertility in China when comparing 342 SSc women to 110 healthy controls [25].

The reason for AMH and thus fertility reduction is still a matter of debate. As reduced AMH levels are also found in other chronic autoimmune diseases, chronic inflammation seems to have an impact [26–28]. In addition, vascular problems and fibrosis of the ovaries can be discussed in SSc patients.

In summary, data on fertility in SSc women are still limited, but there is evidence for a negative influence at least on ovarian reserve. Like in sexual dysfunction, there are many confounders that interfere with a definite conclusion. Nevertheless, treating physicians should address family planning early, not to miss the ideal timepoint for fertility preservation, pregnancy, or artificial reproductive therapies.

3.3. SSc and Pregnancy

Pregnancy in women with SSc is a complex issue that requires careful management due to the potential risks to both maternal and foetal health.

3.3.1. Risks to Maternal Health

Skin: The hallmark of SSc is skin thickening; however, concerns regarding the progression of the condition appear to be negligible during pregnancy. A meta-analysis summarised reports on skin evolution during pregnancy, yielding rather favourable results. The analysis revealed that the deterioration of skin involvement (2.9% during pregnancy and 13.6% postpartum) appeared to be less prevalent than that of improvement (20% during pregnancy) [29].

Renal Involvement: Older works showed no elevated risk of SRC during pregnancy [30]. However, the progression of renal disease during pregnancy can result in

complications, including preeclampsia, renal failure, or severe hypertension. There are documented cases of SRC in pregnancy, mostly occurring after the 20th week of gestation [31–34]. This may complicate the distinction between SRC and preeclampsia. ACE inhibitors have been used to treat SRC in pregnancy but are not recommended during pregnancy because of the associated risk of congenital anomalies. In view of the high frequency of SRC in patients with RNA Pol III antibodies, it may be advisable to postpone pregnancy in the first years following diagnosis.

Cardiopulmonary involvement: Women with SSc may have underlying lung or heart disease, which can exacerbate during pregnancy, increasing the risk of respiratory failure, pulmonary hypertension, or heart failure. Interstitial lung disease (ILD) is prevalent among patients suffering from SSc, affecting approximately 60% of the patient population, albeit with variable degrees of severity [35]. A retrospective analysis of women with ILD of different origins demonstrated that adverse pregnancy outcomes, including prematurity and preeclampsia, were prevalent (28% of women with CTD-ILD) and affected a greater number of individuals when severe ILD was present (60%) [36]. Similar data has been published by other groups [37,38]. However, the progression of ILD seems to not be common.

The prevalence of pulmonary artery hypertension (PAH) in SSc varies, but it has been demonstrated to worsen pregnancy outcomes in women with PAH of different aetiology. This is attributable to the fact that pregnancy-associated physiologic changes in cardiac output and plasma volume increase might negatively impact the maternal and, consequently, foetal cardiovascular system. It is evident that the occurrence of adverse outcomes is associated with this condition, including an elevated risk of preterm birth and intrauterine growth restriction (IUGR) [39,40]. Moreover, there is a paucity of knowledge regarding PAH-targeted drugs such as sildenafil, bosentan, macitentan, and riociguat and their impact on pregnancy. The most recent recommendations made by the European League Against Rheumatism (EULAR) include the potential use of sildenafil [41]. Furthermore, calcium channel blockers and prostacyclin have historically been utilised as therapeutic agents in this context [42].

Preeclampsia and SSc: Different groups demonstrated an elevated risk of preeclampsia in patients suffering from SSc [43,44]. Consequently, the utilisation of acetylsalicylic acid in these patients should be contemplated, despite the paucity of studies conducted on this particular entity. It is a noteworthy observation that women afflicted with preeclampsia exhibit a 69% elevated probability of subsequently manifesting SSc [45].

3.3.2. Foetal Risks

Foetal loss: The incidence of early pregnancy loss (first trimester miscarriage) appears to slightly exceed that of the general population, which is typically about 5–20% [25,29,43]. In contrast, a multicentre Italian study reported an abortion rate of only 4% [46]. Furthermore, a study conducted on a nationwide U.S. basis demonstrated a significant decrease in foetal mortality over the years, thereby indicating an enhancement in the management of pregnant patients suffering from SSc [47].

IUGR and low birth weight: IUGR has been consistently reported through numerous publications, with varying rates (5–30%) [25,43,46,47].

Preterm delivery is also a frequent complication (20–30%). A higher incidence of preterm delivery was observed in pregnancies in SSc patients compared with healthy individuals (OR 6.74, 95%CI 1.29–35.09) [43]. And as in the aforementioned U.S. study, an OR of 2.65 (95%CI 2.23–3.14) was calculated when comparing SSc and non-SSc delivery-related hospitalisations over the entire study period [47]. Some groups suggested a higher incidence in patients with dcSSc [25,43].

Congenital anomalies: Most reports did not reveal an increased rate of congenital malformations in children born to women with SSc. Indirectly, SS-A/SS-B antibodies, which are associated with neonatal Lupus [48], an immune-mediated disease caused by maternal antibodies, can lead to congenital anomalies, as SS-A antibodies are also frequently (approximately 25% of cases) detected in patients with SSc [49]. There is some evidence suggesting that autoimmune diseases, including SSc, may increase the risk of certain congenital anomalies, although this remains an area of ongoing research.

Table 2 summarises the most recent data on pregnancy outcomes in SSc patients.

Table 2. Pregnancy outcomes in patients after disease onset; abbreviations: IUGR = intrauterine growth restriction; NK = not known; SGA = small for gestational age; OR = odds ratio.

Article	N	Mean Age in Years 1. Pregnancy	Autoantibodies	Gestational Age	Prevalence or Risk of Foetal Loss or Miscarriage	Prevalence of Live Births	Prevalence or Risk of Sga or Iugr	Prevalence or Risk of Preterm Delivery	Prevalence or Risk of Preeclampsia
Chicharo et al. [50]	12 pregnancies in 9 women	35.9 +/− 4.9	6 ACA 3 Scl70 2 SSA/SSB	38.2 +/− 1.8	2 miscarriages	10/12 (83.3%)	SGA 33.3%	1/12 (8.3)	NK
Sieiro et al. [51]	88 pregnancies in 50 women	29.5 +/− 7.2	27 ACA 18 Scl70 18 SSA 4 RNP	NK	18% foetal loss	77%	NK	0	3%
Lazzaroni et al. [10]	48	32.0 (29–36)	NK	39.0 (37.0–40.0)	4/36 (11.1)	88.9%	NK	7/36 (19.4)	0/36 (0.0%)
Alrifai et al. [52]	1165	31.2 (5.2)	NK	NK	20 (1.72%)	98.3%	IUGR 80 (6.87%)	105 (9.01%)	NK
Crisafulli et al. [44] and Singh et al. [53]	1403 (meta-analysis from 16 studies)	NK	NK	NK	OR 1.6 (1.22–2.22)	NK	OR 3.2 (2.21–4.53)	OR 2.4 (1.14–4.86)	OR 2.20 (2.21–4.53)
Kawano et al. [47]	3740	30.2	NK	NK	28.9/1000	NK	IUGR 5.5%	21.9%	NK
Barilaro et al. [43]	33 pregnancies in 21 women	35.4 +/− 4.1	NK	31.6 +/− 11.7	21.2%	NK	IUGR 15.2% SGA 21.2%	24.2%	12.1%
Kharbanda et al. [24]	15 pregnancies	NK	NK	NK	40%	60%		26.7%	NK
Taraballi et al. [46]	99 pregnancies	31.8 +/− 5.3	20 ACA 59 Scl70	NK	6% 4% therapeutic abortion	90%	IUGR 6%	25%	0%

In conclusion, the data on maternal and foetal pregnancy outcomes are very heterogeneous due to the different ways of reporting and collecting the data and the included patients' medical health care in the different countries. Nevertheless, there are signs of a higher incidence of adverse pregnancy outcomes in SSc.

3.4. SSc and Menopause

Menopause is defined as cessation of the menstrual period and thus ability to get pregnant. As mentioned before, several influencing factors play a role, and the timepoint of menopause usually varies between the ages of 45 and 55 but can be much younger in patients with SSc [44].

The impact of SSc on the lives of those affected is profound, extending beyond the physical health dimension to encompass the psychological, social, and sexual aspects of life. As most of our patients are women, this paper aims to explore the impact of SSc on sexuality, fertility, pregnancy, and menopause, focusing on both the physiological and emotional challenges faced by women living with this condition.

In the Chinese population, the mean age at which menopause occurred in patients with SSc who had disease onset prior to menopause was found to be significantly younger than in the general population [25]. As stated in the preceding paper from Thailand, early menopause was observed in 35.7% of patients, a phenomenon that was found to be

significantly associated with CYC. The study also identified a correlation between early menopause and both elevated cumulative doses of prednisone and a protracted disease duration [23]. A study conducted in Croatia also reported a reduction in androgen levels (i.e., testosterone, androstenedione, and DHEAS) in postmenopausal women with SSc when compared with a group of healthy, age-matched controls [54].

The reason for non-treatment-related early menopause in SSc is rooted in the reduction in female hormone levels triggered by chronic inflammation, vasculopathy, and fibrosis of hormone-producing organs.

In a recent review article, the authors also found evidence of the impact of hormonal status on the manifestation of diseases. Subsequent to the onset of menopause, there was an improvement in the condition of the skin. However, there is a concomitant increase in the risk of PAH. Moreover, the positive effects of hormone replacement therapy (HRT) on PAH have been delineated in the extant literature [55]. Conversely, Swedish researchers identified a heightened probability of developing new SSc in women undergoing HRT, with an OR of 1.4 (1.2–1.7) [56]. As patients with SSc have a higher risk for osteoporosis [57,58] and premature menopause has been demonstrated to increase this risk, it is recommended that bone density assessment be incorporated into the standard SSc workup [58,59].

4. Discussion

SSc significantly affects various aspects of a woman's life, including sexuality, fertility, pregnancy, and menopause. Figure 1 summarises the different manifestations/influences of SSc on female health. Comprehensive care addressing physical symptoms, emotional well-being, and interdisciplinary collaboration ensures that affected individuals can navigate these aspects of life effectively. The disease itself, coupled with the physical and psychological challenges it presents, can make sexual health and reproductive choices difficult for those living with it. Understanding these issues, along with appropriate medical management, is essential for improving quality of life and ensuring that individuals with systemic sclerosis receive comprehensive care. With advances in medical treatment, psychosocial support, and fertility preservation techniques, many individuals with SSc can lead fulfilling lives and make informed decisions about their sexual health and reproductive futures.

In the Italian and German surveys, patients were asked whether they discussed their sexual disorders with their physicians. The results indicated that 58% and 90.4% of SSc patients, respectively, had never addressed this topic [5,11]. Therefore, it is of utmost importance that medical professionals are open to addressing and finding a way to help our patients by frankly asking about complaints with regard to sexuality, or at least using questionnaires. This will improve the awareness and thus facilitate the identification of the necessity for assistance.

Although the issue of SDF in SSc has been addressed in several studies, there are no clear treatment options so far. It is generally known that physical exercise has a positive effect on the functional and mental health of all patients [60]. Targeted pelvic floor training and physiotherapy have been shown to improve sexuality in healthy individuals [60]. A recently published study from the Czech Republic also showed a significant improvement in a small group through targeted 8-week physiotherapy, including pelvic floor training, even in women with SSc [61]. In general, regular physical activity, including physiotherapy and occupational therapy, is recommended to maintain hand–finger function, which, of course, also plays a role in sexuality. Drug treatment options for SDF in women are limited. Vaseline-containing ointments as lubricants are definitely recommended for vaginal dryness. The data on reduced clitoral blood flow and its negative correlation with FSFI score [4] might indicate that vasoactive substances might improve female sexuality, but studies with phosphodiesterase-5-inhibitors, for example, are missing.

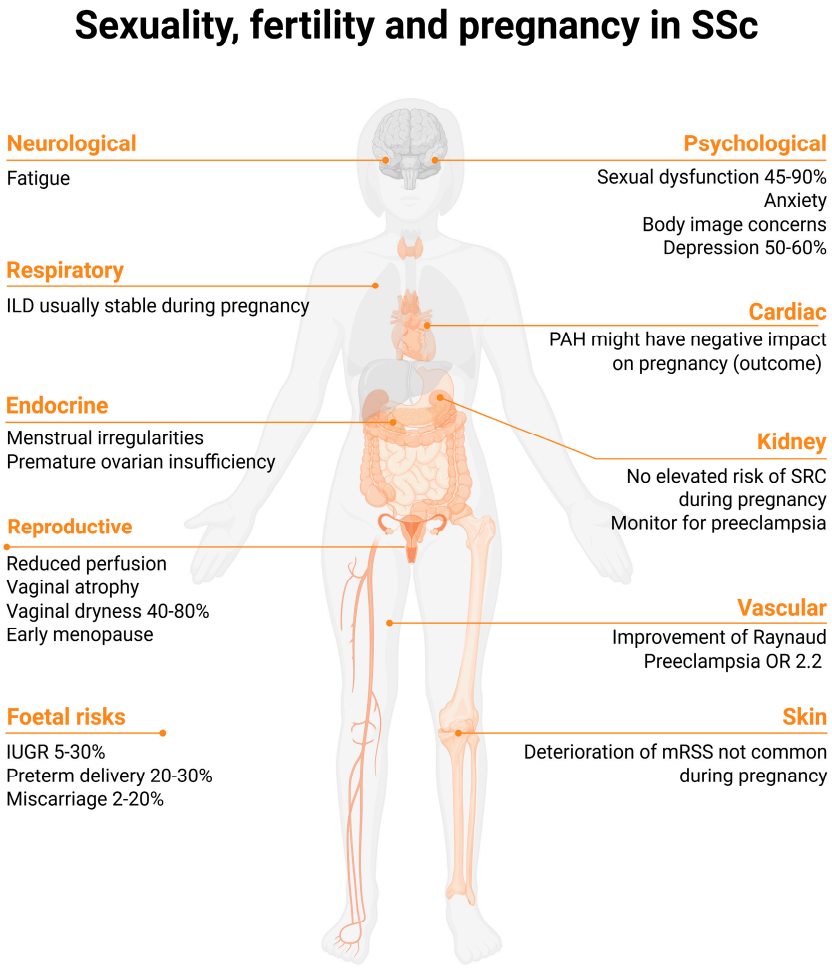

Figure 1. Summary of the effects of systemic sclerosis (SSc) on sexuality, fertility, and pregnancy. (created with BioRender.com).

When a partner becomes a caregiver, this can change the roles in the relationship and put a strain on the sexual relationship. Such changes can cause feelings of dependency or loss of equality, making intimacy even more difficult. Openness to talk about sexual problems is often difficult, which can lead to misunderstandings or a lack of support in partnerships. A lack of communication about needs and fears increases the emotional burden. These emotional factors are closely linked to physical symptoms and should be taken into account when treating sexual dysfunction. Therefore, the help of professional talk/sex/couples therapists is a useful addition [14].

The psychological burden of dealing with SSc can significantly affect the aspects of women's health. Coping with a chronic illness often leads to feelings of isolation, stress, and anxiety, which can exacerbate issues related to sexual health, intimacy, and reproductive decisions. Individuals with SSc may experience changes in their body image due to skin thickening, weight changes, or visible scarring, which can negatively affect their sexual self-esteem and willingness to engage in sexual activity. Counselling, sexual therapy, and support groups may therefore play a crucial role in helping individuals address the psychological impacts of the disease. Providing resources for sexual health and fertility counselling can assist patients in making informed decisions about their reproductive health. Also, the open communication between partners is vital in addressing SDF and maintaining intimacy. Couples may benefit from education and therapy that helps them navigate the challenges posed by systemic sclerosis.

Fertility in SSc patients seems to be reduced compared to healthy controls [22]; therefore, it is of high importance to address family planning early and to define the ideal timepoint for a pregnancy together with our patients.

Pregnancy in the context of SSc necessitates careful management in view of the potential for complications, namely, increased rates of hypertension, preeclampsia, and cases of renal crisis have been reported. It is considered ideal to achieve remission or low levels of disease activity for a period of 3–6 months prior to conception. It is also important to consider the potential risks to the foetus. Women with SSc are at an increased risk of preterm birth and IUGR. Furthermore, miscarriage may also be more prevalent. However, due to difficulties such as underreporting, differences in populations and definitions, as well as inconsistent data collection methods, obtaining meaningful data on pregnancy losses is challenging. Pregnancy risks are frequently associated with vascular complications, such as insufficient placental blood flow. The process of invasion by extravillous trophoblasts into the decidua, accompanied by remodelling of the arteries, is contingent upon the integrity of vascular health. Vascular abnormalities might result in placental insufficiency, which may consequently lead to IUGR, low birth weight, and an elevated risk of stillbirth. Indeed, findings in placental biopsies demonstrated placental vasculopathy [62]. Therefore, interdisciplinary care involving rheumatologists and obstetricians is crucial when counselling SSc patients with wish to become pregnant and during pregnancy. Adjustments in immunosuppressive therapies and close monitoring improve outcomes, and careful monitoring of maternal organ function (renal, cardiopulmonary) is essential. Early diagnosis and treatment of complications, such as hypertension or renal issues, can improve outcomes for both mother and baby. Medication use during pregnancy must be carefully considered, as many immunosuppressive drugs used in SSc are contraindicated during pregnancy [41]. Alternatives must be explored to manage the disease while minimising foetal risks. Azathioprine and low-dose glucocorticoids are considered to be safe for use during pregnancy; in severe cases, B-cell depletion with rituximab might be considered [41,63].

Premature menopause is common in SSc, and as patients with SSc have a higher risk for osteoporosis [57,58], we strongly recommend bone density assessment in all SSc patients on a regular basis. Continued research is needed to explore the full extent of these impacts and to develop better strategies for managing the condition's influence on sexual and reproductive health.

In conclusion, SSc as a systemic disease also has a huge influence on all aspects of women's health, and we as the treating physicians would all do well to be aware of that. Interdisciplinarity, therefore, is a cornerstone of treating patients with SSc, and learning from each other and listening to the patients' complaints will improve all aspects of SSc care.

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