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Pregnancy dermatoses: a study of patients attending antenatal clinic at two Tertiary Care Centers in south west Nigeria

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Abstract

Introduction: *pregnancy is associated with many systemic changes mostly linked with hormones. The skin shows many of these changes as dermatoses - directly related to the pregnancy or an exacerbation/amelioration of a prenatal condition. A few of the pregnancy dermatoses can be fatal if unrecognised early. The aim of this study was to document the spectrum of pregnancy dermatoses and effect on quality of life of pregnant women presenting at the antenatal clinics of two tertiary hospitals in South west Nigeria.* ***Methods:*** *a prospective observational cohort study carried out concurrently at the antenatal clinics of two tertiary hospitals: Lagos University Teaching Hospital (LUTH) and Olabisi Onabanjo University Teaching Hospital (OOUTH) over seven months. Consecutive patients filled questionnaires and had full dermatology examination by specialists with results documented and analysed with SPSS 21st edition.* ***Results:*** *of 296 patients studied, 175; 59.1% first presented for antenatal clinic in the 3rd trimester. Most common symptom was itching (125; 42.2%) and 85.5% had signs of dermatoses. Atopic eruption of pregnancy (AEP) and pruritic urticarial papules and plaques of pregnancy were seen in (11; 3.7%) of patients. A background history of atopic dermatitis was significantly associated with AEP. The most common non-specific pregnancy dermatoses were acne vulgaris (129; 43.6%), superficial fungal infections (119; 40.2%) and melasma (55; 18.6%).* ***Conclusion:*** *skin conditions are common in pregnancy; fatal pregnancy dermatoses were not seen in this study.*

Introduction

Pregnancy is defined as the period from the time of conception to delivery of a foetus. This period is characterized by a range of physiologic and physical changes mostly attributable to the hormones as well as immunological and metabolic changes [1]. One of the most significant changes in pregnancy is seen on the skin, with pruritus (itching) as the most frequently occurring cutaneous symptom [2]. The changes seen in the pregnant skin may be physiological, alteration of pre-existing skin diseases or specific dermatoses of pregnancy [3]. The above skin conditions may have pruritus with or without a rash (*Pruritus Sine Materia*) [4]. Physiological changes include altered pigmentation such as chloasma, changes in the collagen and elastic tissues resulting in linea *gravidarum* and striae distensae as well as changes in the skin appendages nails and hair [3]. Pre-existing skin diseases may improve or worsen in pregnancy, for example systemic lupus erythematosus with renal involvement tends to worsen whilst some pregnant women have improvement in their acne. This is due to the alteration of the cytokines by progesterone with a predominant Th-2 production leading to expression of Interleukins (IL) 4, 5, 10 and 13 that aid in foetal survival [2,3,5]. Some skin disorders are specifically seen during pregnancy and in the immediate post-partum state [5,6]. These specific dermatoses of pregnancy have been classified into four main groups; pemphigoid gestationalis, pruritic urticarial papules and plaques of pregnancy (PUPPP), intrahepatic cholestasis of pregnancy and atopic eruption of pregnancy [7,8]. Some of the above mentioned conditions represent a group of similar diseases which have characteristic lesions in areas of distribution and have been classified for easy nomenclature and management purposes. More than one diagnosis can exist in the same patient requiring multiple medications. Some drugs such as doxycycline that seem beneficial to the pregnant mother may be detrimental to the foetus, in which case a multidisciplinary approach involving the obstetrician, dermatologist and clinical pharmacologist may be needed. Certain dermatoses affecting pregnant women have been noted to be specific for different trimesters [7,9]. Whilst no rule is sacrosanct, a diagnosis can be considered depending on the trimester of pregnancy the patient experiences the condition. While skin disorders may not often result in mortality, some studies have shown that they adversely affect the quality of life of the individuals with attendant psychosocial issues [10,11]. The aim of this study was to document the spectrum of skin

disorders seen in pregnant individuals and quality of life of women presenting at the Antenatal Clinics of two Tertiary Hospitals in south west Nigeria.

Methods

This was a prospective observational cohort study carried out concurrently at the Antenatal Clinics of two Tertiary Hospitals, Lagos University Teaching Hospital (LUTH) and Olabisi Onabanjo University Teaching Hospital (OOUTH) over seven months from 1st July 2017- 31st January 2018. Consecutive consenting walk-in patients at time of booking at the antenatal clinics were reviewed irrespective of gestational age. Demographics and symptoms relating to skin disorders were filled in self-administered questionnaires and a physical examination was carried out by the investigators who are dermatologists. Everyone filled the dermatology quality of life questionnaire to determine the effect of the skin lesions on their quality of life. Investigations such as skin scrapings for mycology, skin biopsy for histology, and others were carried out where necessary to improve diagnoses.

Exclusion criteria: pregnant women with pre-existing systemic illnesses such as chronic kidney disease, diabetes mellitus, and pregnancy. Induced hypertension and pre-eclampsia were excluded from the study.

Ethical approvals: were obtained from the Health and Research Ethical committee of both centres: Lagos University Teaching Hospital (ADM/DCST/HREC/APP/1195) and Olabisi Onabanjo University Teaching Hospital (NREC/28/11/2017) before commencement of the study.

Findings and dermatologic diagnoses: were recorded in the questionnaires and all details entered into Microsoft Excel spreadsheet for analysis. Analyses were done using IBM SPSS Version 21, New York, US. Results are presented in tables, figures and charts. Descriptive statistics was used to document findings. Friedman´s test was used to determine the differences in the domains of the Dermatology Life Quality Index (DLQI) scores. The ranked means were documented, and the differences in the ranked means were considered statistically significant, P-values <0.05. Post hoc test done and Wilcoxon Signed-Rank Test were done to determine the parameters with significant differences.

Results

A total of 296 pregnant women were included in the study. They were between the ages of 18 and 47 years with mean age of mean age of 31.8±5.2 years. Majority of the women seen were between 26 years and 35 years of age (189; 63.9%). Their gestational ages (GA) were between 6 and 41 weeks, and mean GA was 28.1±8.3 weeks. Table 1 shows the summary of demographics of the study participants. Two hundred and ninety-three women were married and only 2 (0.67%) were not married while one had an undocumented marital status. Ninety-eight (33.1%) women had skin problems prior to the pregnancy; 104 (35.1%) complained of new rash in the current pregnancy. Thirty-six women (12.2%) had background history of atopy; 30 (10.1%) of whom had skin lesions. Itching was the most common symptom noted in 125 women (42.2%) followed by pimples in 35 (11.8%) and bullae in 10 (3.4%) women (Figure 1, Figure 2). On examination, skin lesions were noted in 254 respondents (85.8%). Table 2 and Table 3 revealed symptoms of skin lesions, specific morphologic description and parts of the body affected. The face, the trunk and the genital region were the most affected parts of the body. The most common skin morphology seen in the women were papules, hyperpigmentation, macules and maceration in decreasing order of frequency. Nail changes were seen in thirty-three (11.1%) women and most common changes were half and half nails (3.7%) melanonychia (3%) and onycholysis (2.4%). Eighteen women had hair loss during this pregnancy: 17 of them had diffuse hair loss while one had androgenic alopecia.

Eleven women had pregnancy specific dermatoses: 8 (2.7%) had atopic eruptions of pregnancy and 3 (1.0%) had pruritic urticarial papules and plaques of pregnancy. Of the eight (8) women diagnosed with AEP, a history of atopy (atopic diathesis) did not predispose them to skin lesions (P > 0.79) while a background history of atopic dermatitis was significantly associated with atopic eruptions of pregnancy (P= 0.008) with a likelihood ratio of 0.043. None of the women examined had pemphigus gestationalis and intrahepatic cholestasis of pregnancy. The most common skin conditions seen in the pregnant women were acne vulgaris in 129 women (43.6%), followed by superficial fungal infections in 119 women (40.2%), melasma in 55 women (18.6%), post inflammatory hyperpigmentation in 47 women (15.9%) and seborrhoeic keratosis in 25 (8.4%). Amongst the 119 women with superficial fungal infections, sixty-seven (22.6%) had candida infections, thirty-four women (11.5%) had dermatophyte infections and another 34 (11.5%) had pityriasis versicolor. More than one fungal infection co-exists in subjects. Skin disorders designated as others include folliculitis barbae (1), nummular eczema (1), acanthosis nigricans (1), papular urticaria (2), syringoma (2), skin atrophy (1) and hyperkeratotic areola (1) (Table 3) Twenty three percent of the respondent reported that the dermatoses had small to very large effects on their quality of life with domains of symptoms and feelings and daily activities being the most affected. No respondent´s dermatoses had an extremely large effect on the quality of life (Figure 3). None of the women reported any affectation in their work/school and treatment domains. Across all domains, there were significant differences in affectation of the quality of life.

Discussion

Each pregnancy comes with its own peculiarities even in the same female and the influences from a previous pregnancy may impact on the current one. The dermatological changes related to pregnancy are usually easily identified and whilst most are tolerable and pose no morbidity to the females, a few of them can be fatal such as pemphigoid gestationalis and intrahepatic cholestasis of pregnancy [6]. Our study revealed a wide range of dermatoses in pregnancy in about 85.8%, though there were few (8; 3.7%) specific pregnancy-related dermatoses in the study population (Table 3). The majority of females studied were married and, in the 3rd and 4th decades of life which may lend credence to the social way of life of the average middle-class Nigerian who waits to complete basic education before getting married and starting a family. Majority of the study population had attained post-secondary education and there were very few patients below 20 years and above 45 years. The income bracket of the respondents (though not directly studied) may be inferred to be between lower middle class and above from the results as majority of them were post-secondary school leavers and only primary education in the public schools is free in Nigeria [12]. The demographic findings may however be a result of the study sites; both were teaching hospitals and as such may not capture details of those who do not attend antenatal clinics or those in the rural areas who attend spiritual homes and traditional birth attendants´ practices [13].

Majority of the respondents presented for their first antenatal clinic at the third trimester of pregnancy as shown by the mean gestational age (GA) at time of study. This has been recorded in a few other studies in the country [14,15]. This may be related to the poor health seeking behavior of the average Nigerian, the thought that pregnancy is not an ill state, ignorance of the benefits of prophylactic care or the cost of registering for the ANC clinics [13-15]. It is however contrary to two studies carried out some years ago in one of the study centres which show the mean (GA) at booking to be 19.1+7.8 weeks [16] and 18.9 + 7.8 weeks [17]. The shorter duration of this study and the increasing use of information technology in recent times may account for the difference in findings. Pruritus was the most common symptom expressed by the respondents and this was across all trimesters. It was mostly generalized itching without accompanying rash and minimal

excoriations as secondary lesions; this mirrors findings from other studies which report *Pruritus gravidarum* as the most common dermatoses in pregnancy [3,4,18]. Humidity of the tropical environment could be an explanation for this symptom in our study as well as the hypermetabolism of the pregnant state and increase in eccrine sweat gland activity which may account for dryness and xerosis contributing to the itching [3]. Though pruritus may be the harbinger of more specific dermatoses of pregnancy, it was not seen to be the case in this series as there were very few of the latter. The next common symptom was appearance of pimples on the face and trunk mostly with a corresponding 52% of papules noted on examination. Acne *Vulgaris* was diagnosed in almost half of the patients and as the most common dermatosis. This divide is not surprising because whilst acne may improve in pregnancy, there is *Acne Gravidarum* which is a tenacious and persistent aggravation of acne as a result of disturbed sebaceous gland activity [1,19]. Acne Vulgaris has been documented alongside striae *gravidarum* as part of the physiologic changes in pregnancy [20]. There is an increase in the activities of the sebaceous glands in the first trimester and increased tendency to *Acne Vulgaris* in the third trimester [19,21]. Data on this disturbed gland activity; whether an increase or decrease in sebaceous gland activity is somewhat controversial among different authors [1]. Lower frequency was however documented in India [18].

Hyperpigmentation was noted in 36.1% of cases with the accompanying diagnoses being Melasma in 18.9% and Post Inflammatory Hyperpigmentation seen in 15.6% of cases. Hyperpigmentation is often noted as part of the physiologic changes in pregnancy as a result of high levels of melanocyte stimulating hormone, oestrogen and progesterone [19,21,22]. Study done in North India revealed higher prevalence of pigmented disorders in their cohort which set out to document specifically the physiologic changes of the skin in pregnancy [22]. Our study did not set out to highlight physiologic changes which were not clinically relevant hence the apparent lower frequency in this study. Exogenous ochronosis was not a common diagnosis in this cohort of patients, contrary to the expectation with the purported rise in use of skin lightening creams among Nigerian women [23]. The specific dermatoses of pregnancy were not a common finding in this study with Atopic eruption of pregnancy (AEP) and Pruritic urticarial papules and plaques of pregnancy (PUPPP) seen in only 2.7% and 1% of cases respectively. We found that a history (personal and family) of the atopic diathesis in this study did not predispose the patients to skin lesions but a background personal history of atopic dermatitis significantly predisposed the pregnant women to the development of atopic eruptions of pregnancy. This is in keeping with findings from Ambros-Rudolph and team who grouped AEP to include pregnant females with atopic dermatitis, prurigo of pregnancy and pruritic folliculitis of pregnancy and found it to be the most common specific dermatoses of pregnancy [7]. Puri and Puri documented prurigo of pregnancy (a component of AEP) as the second most common specific dermatosis of pregnancy in a small cohort in India after polymorphic eruption of pregnancy [24]. It is worthy of note that the study by Puri employed the older classification by Holmes and Black [8]. None of the pregnant women seen in this study presented with intrahepatic cholestasis of pregnancy and pemphigoid gestationis. The study done in North India also showed that prurigo of pregnancy was the most common specific dermatoses of pregnancy with decreasing frequency of intrahepatic cholestasis of pregnancy (ICP) and pemphigus gestationis [22]. It is not clear whether their findings represented a genetic predisposition or not; or the presence of probably protective factors in the Nigerian pregnant women. Intrahepatic cholestasis of pregnancy is known to have a higher prevalence in Scandinavia and South America while the latter is rare worldwide [1]. Perhaps a larger sample size and a multicentre nationwide study may reveal other findings.

This study also documented a high prevalence of infections predominantly fungal second only to *Acne Vulgaris*. This finding is at variance with

findings in pregnancy in other climes which documented very few infections [18,22]. On the other hand, our finding is in consonant with epidemiological studies across Nigeria (at dermatology clinics and communities) which revealed infections as the most common dermatoses across all ages apart from the adolescents [25-27]. Some of the factors noted to be responsible for the high prevalence of infectious disorders in Africa include poor socioeconomic status, low literacy levels, hot humid climate, poor hygiene, overcrowding and high interpersonal contact [28]. Furthermore, pregnancy is associated with alteration in immune status which is associated with immune tolerance of the fetus as well as reduced cellular immunity predisposing the woman to infections [29]. Whilst more than three quarters of the women seen reported nil effect, the remaining had small to very large effects on their quality of life. The domains of symptoms and feelings were significantly more affected than other domains. This suggests that pregnant women will benefit from prompt relief of symptoms and feelings in order to enhance their psychological well- being and ability to cope with activities of daily living. It is important that obstetricians and physicians be familiar with use of medications and procedures to treat dermatologic conditions in pregnancy [30]. The small sample size and the study centers being tertiary are clear limitations to this study. The pattern may be different in the primary and secondary health care centres. The study may also have revealed more dermatoses or a change in pattern of skin diseases if the subjects were reviewed at each trimester of pregnancy in a longitudinal study. Any discussion on previous management of dermatoses in pregnancy cannot be made in this study as this was the first encounter with the dermatologists. An extensive nationwide study may give a robust result for more accurate scientific inference on the prevalence of specific dermatoses of pregnancy in our environment and offer evidence-based management strategy.

What is known about this topic

- *Pregnancy dermatoses are varied and seen across different trimesters of the period;*
- *The non-specific pregnancy dermatoses are much more common than specific dermatoses of pregnancy.*

What this study adds

- *Dermatoses are common in pregnant Nigerians and should be assessed;*
- *A personal history of atopic dermatitis was significantly associated with Atopic Eruption of Pregnancy which is one of two pregnancy dermatoses seen in Nigeria that are noted to be common in other climes;*
- *Specific dermatoses of pregnancy such as Intrahepatic Cholestasis of Pregnancy and Pemphigus Gestationis were not seen in this study and are likely uncommon in Nigeria.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Ayanlowo OO: conceptualization of the study, drafting, data acquisition analysis and interpretation; article drafting and revision and final approval of version to be published. Otrofanowei E: conceptualization and study design, acquisition of data, analysis and interpretation of data; drafting the article and final approval of manuscript. Shorunmu TO: study design, data acquisition and interpretation, article revision and final approval of manuscript. Adegbola O: study design, data acquisition and interpretation, critical revision of article and final approval of manuscript.

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Tables and figures

Table 1: demographics of study participants

Table 2: parts of the body affected by skin lesions in pregnancy

Table 3: skin disorders in pregnancy (more than one diagnoses may be seen in subjects)

Figure 1: frequency of symptoms of skin lesions

Figure 2: morphologic distribution of skin lesion

Figure 3: effect of skin disorders on the quality of life in pregnant women

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Table 1: demographics of study participants	
Demographic characteristics	**Frequency n = 296**
Age range	18 to 47 years
Mean ± SD	31.87 ± 5.2
Frequency of Age groups	n (%)
< 20 years	2 (0.7)
21 - 25 years	33 (11.1)
26 - 30 years	81 (27.4)
31 - 35 years	108 (36.5)
36 - 40 years	52 (17.6)
41 - 45 years	9 (3.0)
>46 years	3 (1.0)
Not disclosed	8 (2.7)
Educational status	n (%)
Nil	5(1.7)
Primary School	5(1.7)
Secondary	63(21.3)
Post-secondary	223 (75.3)
Pregnancy duration (Trimester)	n (%)
1st trimester	27 (9.1)
2nd trimester	88 (29.7)
3rd trimester	175 (59.1)
Unknown	6 (2.0)
Range (Gestational age)	6 to 41 weeks
Mean SD (Gestational age)	28.1 ±8.3

Table 2: parts of the body affected by skin lesions in pregnancy	
Parts of the body (multiple parts may be affected)	**Frequency (%)**
Face	176 (59.4)
Upper trunk (Back)	73 (24.7)
Upper trunk (front)	74 (25)
Pubic/Genital region	65 (22)
Lower limbs	24 (8.1)
Flexures (Infra mammary 18, others 3)	21 (7.1)
Abdomen	19 (5.7)
Upper and lower trunk (Back)	17 (5.7)
Upper limbs (with hands 2)	15 (5.1)
Upper and lower trunk (front)	9 (3.0)
Neck	5 (1.7)
Breast	4 (1.3)
Scalp	4 (1.3)
Gluteal	3 (1.0)

Table 3: skin disorders in pregnancy (more than one diagnoses may be seen in subjects)	
Skin disorders	**n (%)**
Pregnancy Specific Dermatoses	
- Atopic eruptions of pregnancy	8 (2.7)
- Pruritic urticarial papules and plaques of pregnancy (PUPPP)	3 (1.0)
Other Skin Disorders	
Acne vulgaris	129 (43.6)
Infections	122 (41.2)
- Fungal	119 (40.2)
- Bacteria (furuncles 2, impetigo 1, erythrasma 1)	4 (1.3)
- Viral (herpes simplex 2, verrucae 2)	4 (1.3)
Pigmentary disorders	
- Melasma	55 (18.6)
- Post inflammatory hyperpigmentation	47 (15.9)
- Exogenous ochronosis	7 (2.4)
- Melanocytic naevi	5 (1.7)
- Others (idiopathic guttate hypomelanosis 1, freckles 1)	2 (0.7)
Pruritus related lesions	
- Excoriated marks	35 (11.8)
- Lichen simplex chronicus	15 (5.1)
- Bath related pruritus	5 (1.7)
- Prurigo nodules	2 (0.7)
Seborrhoeic keratosis	25 (8.4)
Seborrhoeic dermatitis	23 (7.8)
Miliaria	14 (4.7)
Scars (Keloid 3, Hypertrophic scars 3)	6 (2.0)
Hyperhidrosis	5 (1.7)
Benign papilloma	4 (1.3)
Others	9 (3.0)

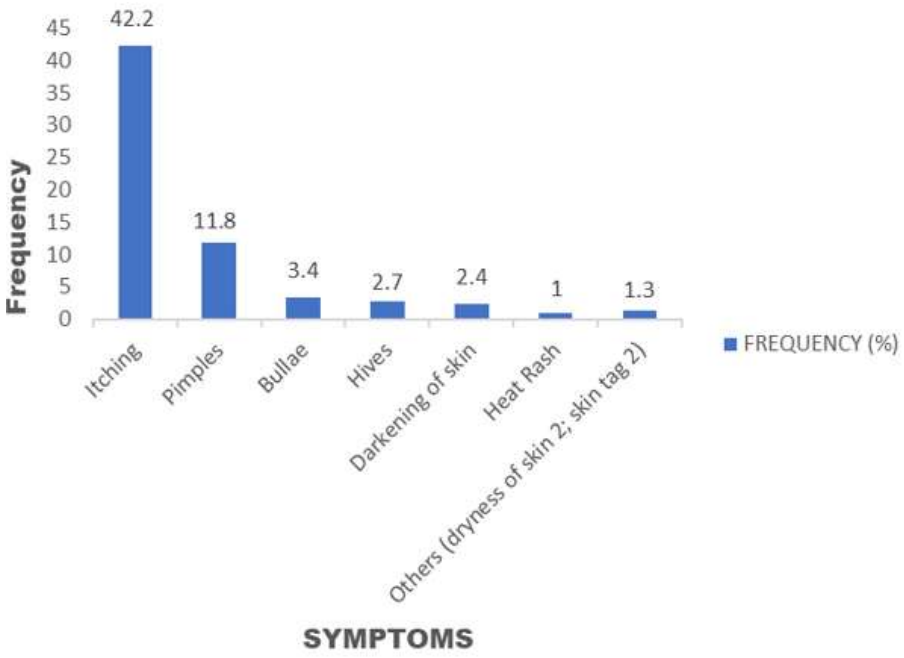

Figure 1: frequency of symptoms of skin lesions

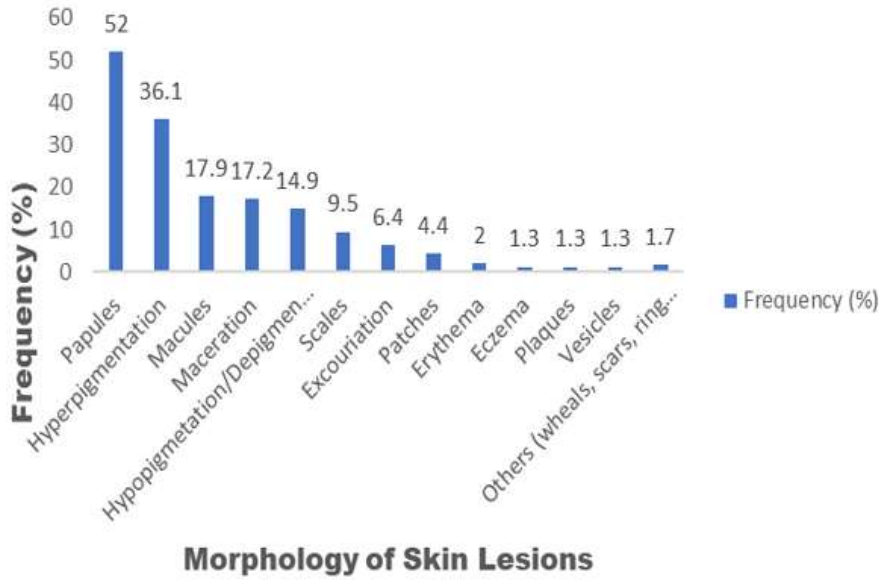

Figure 2: morphologic distribution of skin lesions

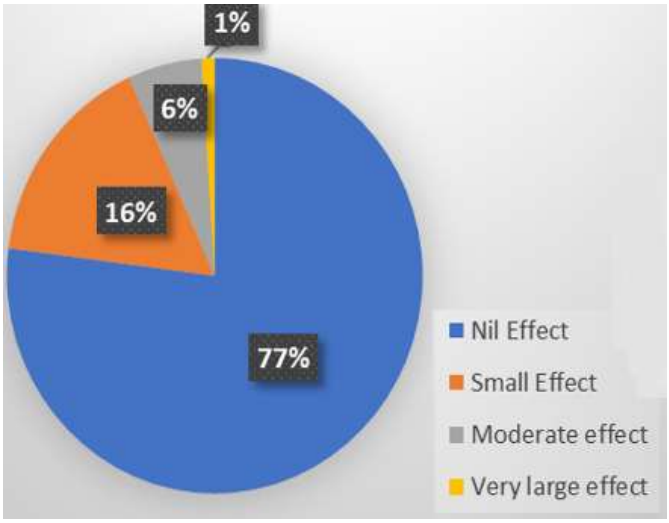

Figure 3: effect of skin disorders on the quality of life in pregnant women