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Original Research Article

Comorbidities among infertile women at NKST hospital Mkar-Gboko, North-Central Nigeria

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ABSTRACT

Background: Infertility, a common, non-fatal ailment, is sometimes associated with substantial comorbidity that can add adverse outcomes during treatment or pregnancy and increase costs of care. This study aims to assess the magnitude and pattern of comorbidities in infertile Nigerian women.
Method: This descriptive retrospective study was undertaken at NKST Hospital Mkar-Gboko, Nigeria, from 1st January 2005 to 31st July 2013. Clinic records of patients who attended the gynaecological outreach clinic were retrieved and analyzed using descriptive statistics and test of associations with Microsoft Excel 2013. Jos University Teaching Hospital gave ethical clearance.
Results: 1,926 women seen during the study period, 1030 (53.5%) presented for infertility care. 941 (91.4%) women had complete records, among them, 476 (50.5%) met the inclusion criteria, and their records were analyzed. The mean age of the women was 32.6±6.0 years with a range of 20 to 53 years, see Table1. There were 52 comorbid conditions among the 476 women. The comorbidities included uterine myoma, previous appendectomy/pelvic surgeries, genital tract infections/retroviral disease, hypertension, obesity and diabetes, among others, see Table 4. Table 2 and 3 shows there is a significant statistical association between comorbidity type, age, parity, duration of infertility and symptoms complex between infertile women and comorbidities ($p<0.05$).
Conclusion: Comorbidities that can influence treatment and pregnancy outcomes are common among infertile women in central Nigeria. This finding strongly supports the routine assessment of women for comorbidities during infertility care for appropriate multidisciplinary management and counselling.

Keywords: Infertility, Comorbidities, Multidisciplinary care, Central Nigeria

INTRODUCTION

The prodigious statistics about population growth can inundate a weightier problem of population dynamics called "infertility" Infertility is a worldwide health concern, but mainly in the developing world, affecting 8-15% of couples.[1-4] It is puzzling, Africa that is overwhelmed with population statistics is also the most smashed with infertility problem and response because of cultural dynamics causing couples even in advanced age to desire childbearing. Infertility is also a multifactorial problem and therefore needs to be seen in the local context for the determinants, factors causing it and so the associated health challenges. It is a commonplace to see older females seeking infertility care and often presenting with other health issues.[5] The literature is awash with women 60 years and older (the oldest 73 years) carrying pregnancies and delivering.[6,7] Women with infertility could experience a myriad of comorbidities that might be gynaecological, medical, and surgical or the sequel of therapeutic interventions. The comorbidity defined as the presence of one or more additional conditions often co-occurring with the primary disease of interest describes the effect of all other conditions an individual patient might have other than the prime condition, and this can be physiological, psychological or economic.[8]

Though infertility by itself does not threaten physical health, it has a substantial impact on the physiological, psychological and social well-being of the woman.[9,10] When also combined with comorbidity, can results in a varying mode of presentation and complication during treatment and in pregnancy.[5,11] The increasing prevalence of medical disorders such as infectious diseases (genital and non-genital), diabetes, hypertension, and lifestyle diseases like obesity and addictions in the young are also known to contribute to the problem of infertility.[1]

Furthermore, infertility is not only a medical challenge but also takes a significant toll psychologically and financially on the patient.[10] Besides, associated comorbidity may add adverse health outcomes, more complex clinical management, and increased health care costs for the infertility treatment and pregnancy that may follow.[12] The compelling pressure of infertility, depending on the socio-economic and cultural setting from which the patient comes, may conceal the comorbidity including the manner of clinical presentation that often varies from one place to another.[3,12,13] Additionally, the association of "overall" female infertility with later-life morbidity requires paradigm view in infertility causes and their management.[14] The realisation of the effect of comorbidities on infertile women is thus critical for proper assessment of the patient towards identifying those at elevated risk from the infertility treatment or pregnancy.[5] Hitherto, it appears there is ignorance about the influence of these coexisting medical conditions on the outcome of care for infertile patient. So also scanty at present, is information about the prevalence and effects of comorbidities on infertile women in our region. Therefore, this study aims to assess the magnitude of comorbidities and the clinical presentation in Nigerian infertile women, make appropriate recommendations for providing empathetic clinical and psychological care that can give value for the effort when the patient presents.

Aim of the study was to determine the magnitude and pattern of comorbidities and clinical presentation among infertile Nigerian women seen at a rural gynaecological outreach clinic.

METHODS

Study type

Study type was descriptive retrospective study.

Study place and duration of study

The study took place at NKST *('Nongu U Kristu U I Ser sha Tar')* Hospital Mkar-Gboko, Benue State, north-central, Nigeria. The facility is a 170-bed secondary level mission hospital, established in 1925. The study was over eight years, 1st January 2005 to 31st July 2013.

Selection criteria

The study subjects were selected from the women who registered at the outreach clinic to see the gynaecological team from Jos University Teaching Hospital, Jos. Most of the patients came by self-referral following the announcement by word of mouth in worship places. An outpatient register was kept on all patients who came to the clinic. The clinical impression of the patient's conditions/diagnosis was arrived at after history, physical examination and minimal investigation and recorded in the case notes. This study was based on the outpatient consultations in the gynaecological clinic; therefore, patients requiring gynaecological emergency attentions at the hospital were excluded. Comorbidity in this study was defined as a health condition other than the infertility, previous abdominal or pelvic surgery and a pre-existing medical ailment identified or declared by the patient during evaluation.

The inclusion criteria for the study included involuntary failure to conceive for over 12 months, patients with symptoms at presentation, previous abdominal/pelvic surgery and pre-existing medical illness. The exclusion criteria included: Infertility with no symptoms at presentation, no previous abdominal/pelvic surgery and no pre-existing medical ailment.

Study procedure

During the period, 1st January 2005 to 31st July 2013, all women who attended the gynaecology outreach clinic were identified from the outpatient register. Names of the patients and their hospital numbers were obtained. With this, case notes of the patients were retrieved from the health records department, and relevant data based on the inclusion criteria including age and parity were extracted and compiled, entered into Microsoft Excel spreadsheet and analysed.

Ethical approval

The management of NKST Hospital Mkar-Gboko and the research and ethic Committee of Jos University Teaching Hospital gave ethical approval for the study.

Statistical analysis

The data obtained were analysed by descriptive statistics and test of associations where appropriate using Microsoft Excel 2013 to get the frequencies, means and degree of significance. Tables 1-6 display the data.

RESULTS

Women with the complaint of inability to conceive were 1030 (53.5%) out of 1,926 women seen during the period under review. The number of folders with complete information were 941, representing 92.0% of the infertile women. Of the 941 women, 476 (50.5%) met the

inclusion criteria, had at least one comorbidity, and formed the study subjects.

Among the women with comorbidities, 166 (38.8%) had primary infertility while 310(61.2%) had secondary infertility. The age range was 20 to 53 years, with a mean age of 32.6±6.0 years. Majority of the women (n=296, 62.2%) were age 34 years or younger.

Most of the women (n=417, 87.6%) were of low parity, and the majority of them (n=359, 75.4%) had one or no child. Of the women, with previous deliveries (n=241, 50.6%), 17.8% had no living child

The mean duration of the infertility was 7.35 years±5.06 years with a range of three months to 32 years. The peak period at presentation was four to eight years among 56.3% of the women. Most of the women (n=246, 51.7%) had their infertility for more than five years. (Table 1)

There were 52 comorbid conditions among the 476 infertile women studied. Of the 476 women, 224 (47.0%), 77 (16.0%), and 43 (9.0%) of them had gynaecological, medical and surgically related morbidities respectively. In comparison, 132 (28.0%) of the women had various combinations of morbidities beside infertility, (Table 2)

Table 2 and 3 show that there is a significant statistical association between comorbidity type, age, parity, duration of infertility and symptoms complex between infertile women and comorbidity types ($p<0.05$) among the study subject.

Table 1: Distribution of the socio-demographic characteristic of women with comorbidity and infertility (n=476).

Variable	Frequency	Percentage (%)
Age (years)		
≤20	4	1
21-25	53	11
26-30	149	31
31-35	123	26
36-40	107	22
41-45	29	6
46-50	9	2
>50	2	0
Total	476	100
Parity (n=476)		
0	235	49
1	124	26
2	58	12
3	26	5
4	17	4
5	11	2
≥6	5	1
Total	476	100
Living children (n=476)		
0	278	58
1	114	24
2	41	9
3	27	6
4	9	2
5	5	1
≥6	2	0
Total	476	100
Child/mother	1.8	
Duration of infertility (years) (n=476)		
<1	18	4
1, 2	58	12
3, 4	100	21
5, 6	95	20
7, 8	73	15
8, 10	42	9
>10	90	19
	476	100

Continued.

Variable	Frequency	Percentage (%)
Range	3 months-32 years	
Mean	7.35 years	
Standard deviation	5.1	

Table 2: Association between comorbidity type among infertile women (n=476).

Comorbidity type	Obsed	Exped	$\chi 2$	Df	P value
Gynecological conditions	224	119			
Medical conditions	77	119			
Surgical conditions	43	119			
Multiple comorbidities	132	119	153.43	3	<0.01

Table 3: Association between comorbidity type and age, parity, duration of infertility and symptoms among infertile women.

	Gynaecological	Medical	Surgical	Multiple	X^2	Df	P value
Women with comorbidities							
Age (years) (n=476)							
≤34	144	46	35	71	11.2	3	0.01
≥35	80	31	8	61			
Parity (n=476)							
Para 0	109	39	25	62	35.07	3	<0.01
Para ≥1	115	38	18	70			
Duration of infertility (Years)(n=476)							
≤ 5	97	45	22	66	44.97	3	<0.01
> 5	127	32	21	66			
Symptoms (n=476)							
No	57	25	12	21	299.18	3	<0.01
Yes	167	32	21	66			
Comparison of age, parity, & duration of infertility with infertile women with comorbidities							
Age (n=941)							
Age (years)	**Yes comorbidity**	**No comorbidity**	**X^2**	**Df**	**P value**		
≤34	296	354	21.41	1	<0.01		
≥35	180	111					
Parity							
Para 0	235	267	6.12	1	<0.01		
Para ≥ 1	241	198					
Duration of infertility (years)							
≤ 5	230	221	0.06	1	0.81		
>5	246	244					

Table 4: Conditions amongst the infertile women that attended gynaecology outreach clinic (n=678).

S. no.	Condition	Number	Percentage (%)
1	Uterine fibroid	147	22
2	Myomectomy	59	9
3	Appendectomy	47	7
4	Genital tract infection	41	6
5	Retroviral diseases	39	6
6	Ectopic pregnancies /Salpingectomy	35	5
7	Depression	33	5
8	Laparotomy	32	5
9	Hypertensions	31	5
10	Obesity	25	4
11	Asherman's disease	24	4
12	Tuboplasties	23	3
13	Previous Caesarean sections	20	3

Continued.

S. no.	Condition	Number	Percentage (%)
14	Ovarian cyst	16	2
15	Candidiasis	10	1
16	Diabetes mellitus	9	1
17	Genital prolapse	9	1
18	Malaria	8	1
19	Anaemia	7	1
20	CIN I-III/HSIL/Early CaCx	6	1
21	Premature ovarian failure	5	1
22	Cervical laceration	4	1
23	Congenital Uterine anomaly	4	1
24	Vulvo-vaginal warts	3	0
25	Chronic pelvic pain	3	0
26	Endometriosis	3	0
27	Femoral hernia	3	0
28	Urinary tract infections	3	0
29	Gonadal dysgenesis	2	0
30	Palpitation	2	0
31	Filariasis	2	0
32	Goitre	2	0
33	3o Perineal tear	2	0
34	Ruptured uterus	1	0
35	Enlarged kidneys	1	0
36	Hearing impairment	1	0
37	Helminthiasis	1	0
38	Adenomyosis	1	0
39	Stress incontinence	1	0
40	Menorrhagia	1	0
41	Lumbar gibbus	1	0
42	Lipoma	1	0
43	Breast lump	1	0
44	Urge incontinence	1	0
45	Previous right femor fracture with deformity	1	0
46	Right hip pain	1	0
47	Splenomegaly	1	0
48	Suburethral cyst	1	0
49	Cervical polyps	1	0
50	Haemorrhoid	1	0
51	Peritoneal schistosomiasis	1	0
52	Pulmonary tuberculosis	1	0
	Total	678	100

Table 5: Distribution of presenting complaint(s) among infertile women with comorbidity that attended the gynaecology outreach clinic (n=1042).

S. no.	Presenting complaints	Frequency	Percentage (%)
1	Anal pain	1	0
2	Back pain	34	7
3	Bleeding at intercourse	4	1
4	Body heat	6	1
5	Body rash	1	0
6	Breast discharge	3	1
7	Cervical laceration	1	0
8	Cough	1	0
9	Excessive hair growth	1	0
10	Fever	1	0
11	Frequent urination	1	0

Continued.

S. no.	Presenting complaints	Frequency	Percentage (%)
12	Frequent urination at night	2	0
13	Headache	12	3
14	Heavy menstruation	54	11
15	Infrequent coitus	1	0
16	Irregular menstruation	42	9
17	Low libido	1	0
18	Lower abdominal pain	182	38
19	Lower abdominal swelling	67	14
20	Lump in breast	1	0
21	Lump over right hip	1	0
22	No menstruation	63	13
23	Pain at intercourse	5	1
24	Pain at urination	1	0
25	Painful menstruation	1	0
26	Palpitation	4	1
27	Pelvic swelling	1	0
28	Perineal pain	1	0
29	Poor sleep	3	1
30	Recurrent Child losses	1	0
31	Recurrent pregnancy losses	3	1
32	Scanty menstruation	8	2
33	Second opinion	1	0
34	Swelling in vagina	7	1
35	Told has lesion on cervix	1	0
36	Upper abdominal pain	1	0
37	Vaginal discharge	41	9
38	Vulval itch	4	1
39	Wants to Conceive	476	100
40	Weakness lower limb	1	0
41	Weight gain	2	0
Previous surgeries (n=209)			
1	Myomectomy	49	23
2	Appendicectomy	47	22
3	Salpingectomy for Ectopic	33	16
4	Laparotomy	21	10
5	Caesarean Section	19	9
6	Tuboplasty	23	11
7	Ovarian cystectomy/Wedge resection	11	5
8	Dilatation and curettage	4	2
9	Previous Total abdominal hysterectomy	1	0
10	Ruptured uterus	1	0
	Total	209	100

Table 6: Distribution of the main physical findings amongst the infertile women with comorbidity that attended gynaecology outreach clinic (n=557).

S. no.	Physical findings	Frequency	Percentage (%)
1	Abdominal Scar	194	35
2	Enlarged uterus	159	29
3	Vaginal discharge	40	7
4	Pelvic tenderness	28	5
5	High blood pressure	28	5
6	Galactorrhoea	26	5
7	Obesity	26	5
8	Hirsutism	25	4
9	Genital prolapse	7	1

Continued.

S. no.	Physical findings	Frequency	Percentage (%)
10	Pallor	6	1
11	Acne	4	1
12	Others	14	3
	Total	557	100

Others include perineal laceration 2, no breast 1, inguinal swelling 2, cervical laceration 2, breast lump 1, genital warts 1, enlarged spleen 1, enlarged kidneys 1, rectal fistula 1, haemorrhoid 1, and urethral diverticulum 1.

The main complaints in the women beside inability to conceive were lower abdominal pain, abnormal menstruation, lower abdominal swelling, vaginal discharge and back pain. In the review of previous treatment, 165 (34.7%) of the women had 209 abdominal surgeries, some of the women, 27.9% had more than one surgery. Majority of the women 391 (82.1%) had notable findings on physical examination (Table 6).

DISCUSSION

The study showed that infertility is a common problem in central Nigeria and over half (50.5%) of the women had at least a comorbidity significant enough to impact on the course of management of infertility and or the successful pregnancy that may follow. Gynaecological problems (uterine myoma, genital tract infections and tubal diseases), surgical problems (previous surgeries: myomectomies, tuboplasties, appendectomy and other laparotomies) and medical conditions (retroviral disease, depression, hypertension, obesity and diabetes) among others were the comorbidities identified in the study subject.

Secondary infertility was the commonest type of infertility in the study population. Secondary infertility has been a consistent finding in this country but at variance with the findings in Asia and North Africa, where primarily infertility is more prevalent.[1,3,12,13,15-20,21] The high rate of secondary infertility against primary infertility suggests infection process from sexually transmittable infections, post-abortion and puerperal complications affecting the genital tract, especially the uterine tubes.[15] The tubal factor is the most common cause of infertility in this country. [7,15,17,22]

The mean age of the women was 32.6±6 years, with the majority of the women ages ≤34 years. This mean age is far above the median national fecundity age of 21 years.[18] The type of infertility and age distribution among the women that attended the outreach clinic represented a full spectrum of patients with infertility, from the early twenties to middle age and were similar to that observed by other studies.[12,15,19,20] The women distribution shows the desire for fertility was expressed across all the age groups and reflects the cultural and social pressure childless women go through in the region. Though the majority of the women were 34 years and younger, there was no teenage girl among the patients with comorbidities. In a previous report from this centre and study from Bauchi, Gombe, and Sokoto in northern Nigeria reported the findings of women ages less than 20 years in 2%, 3.2%, 5.6% and 7.6% respectively.[3,4,8,12,23] Furthermore, the average age of infertile women reported from most of the studies across the country is 25 to 35 years correlating with our finding.[8,16,17,22,23] Likewise, when the oldest woman in our population was 53 years, the oldest at Calabar, Bauchi and Delta were 39, 42 and 45 years respectively, is suggesting advancement in the age women are opting for procreation in Nigeria.[17,18,23] The mean age at presentation for uterine myoma reported from various centres across this country is 35–40±6 years and least common by age 20-24.[24-26] Nnewi study reported that 76% and 30.1% of the women who presented with uterine myoma were nulliparous and infertile, respectively.[26] In this study, age showed a statistically significant association with comorbidity in infertility as noted between patients ≤34 years and those >35 years ($p<0.05$). Considering that the prevalence of most non-communicable diseases rises with age, it is easy to understand the increasing prevalence of coexisting medical disorders in infertile patients over their lifespan and clinician need to take note of this trend.[27] And as the older population increases, and with increasing availability of advanced infertility care that gives hope, more older childless Nigerian women will attend infertility clinics.

The wide range of parity (0-8 deliveries) among the women studied notwithstanding, the average fertility (1.0±1.4 deliveries) of the women was very low compared to the north-central zone total fertility rate of 5.0.[18] The study found a statistically significant association between parity and comorbidity type in infertile women ($p<0.05$). This association supports the need for screening infertile women for comorbidity during evaluation.

Though some of the women (2%) presented earlier (less than one year of not achieving pregnancy, some as early as three months of marriage) than the definition of infertility allows, a late presentation was common among the women. The mean period at presentation among the women with comorbidity was 7±5 years. Most of these women (52%) had infertility five years or over.[7,8] the 2% women that reported earlier than this period echoes the societal pressure associated with a desire for procreation after marriage.[13] The late presentation means the patients' are older by the time they present, as seen in this study. Although some got married at an early age, over half were in their late thirties and older, a time when their reproductive potentials could have started declining, risk of marital disharmony and comorbidities that can risk

treatment and pregnancy set in as shown in this study.[8,29,30]

The over half of the women that presented with infertility at Mkar had 52 comorbid conditions. The comorbidity types were statistically significant among the infertile women ($p<0.05$). The mean age at presentation with uterine myoma reported from centres across this country is 35-40 ± 6 years and least common by age 20-24.[24,25,29] Other centres reported similar findings of comorbid conditions among their study subjects.[1,22,23] The associated comorbidities seen among the women could add adverse health outcomes, more complex clinical management, and increased health care costs for the treatment and pregnancies that may follow. Additionally, the association of "overall" female infertility with later-life morbidity requires a paradigm view in infertility aetiologies and their management. As aforementioned, it is vital that infertile women, especially those aged thirty and older get proper assessment towards identifying those at elevated risk from the infertility treatment or pregnancy to provide appropriate empathetic clinical and psychological care that will give value for the effort.[5]

Comorbidity also adds to the dilemma of caring for infertile women in our environment. The delusive presenting complaints by the women can cause distraction in the clinical approach to management when there is comorbidity. We found that less than 50% of the women volunteered inability to conceive as their primary reason to visit the clinic. Non-presentation of failure to conceive as a primary complaint by women is a common feature in our clinics.[15,23,30] Primary complaints like headache, sleeplessness, backache etc. have been reported in many studies across this country depending on cultural inclinations.[2,3,5,12,19] These delusive presentations of infertility in the face of comorbidity have the potential of misdirecting the weary clinician towards wrong diagnosis and inappropriate intervention. For examples, 34.7% of the women had abdominal surgeries with myomectomy, appendectomy, ectopic pregnancy and unspecified laparotomy as the primary (68%) reasons for the surgeries. Some of the women (19.6%) had the surgeries more than once. Most of these surgeries might be to resolve the women complain of abdominal pain. Certainly, these interventions where spuriously done can pose a significant risk to the woman who has infertility.

It may also be on the same premise that some women are treated severally for 'chronic' pelvic inflammatory diseases or psychiatric disorders, thereby compounding the woman's concern for failure to conceive.[3,12,19,30] Infertility, by itself, does not threaten physical health. However, when combined with comorbidity can result in a varying mode of presentation and complication during treatment and in pregnancy, consequently, with a substantial impact on the physiological, psychological and social well-being of the woman as seen in this study.[19,29] It is the realisation of the effect of comorbidities on infertile women that proper assessment of the patient is critical and strongly advocated to identify those at elevated risk from the infertility treatment or pregnancy.[5]

Limitation of the study

This was a retrospective study conducted in a rural secondary care centre during outreach visits. Being a retrospective study, we were just able to gather information from clinical history, physical finding and some basic investigations at the point of contact to arrive at the diagnosis for the care of the women. Therefore, there could be a possibility of missing out some characteristics that may make some patients distinct compared to other infertile women. Future population-based studies are required to validate some of the findings from this study.

CONCLUSION

Infertility is associated with significant comorbidity burden among women in this study population. With over 50% of the women in our study with additional health problem besides infertility calls for all infertile women (particularly those age above 30 years) attending our clinics also to get screened for other health challenges towards identifying those at elevated risk from the infertility treatment or pregnancy.

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