

Gynecological and Related Morbidities among Ever-Married Omani Women

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ABSTRACT

To assess the prevalence and correlates of gynecologic and related morbidity in Omani women, a nationally representative sample of Omani women selected by a multi-stage, stratified probability sampling procedure was selected (total = 364). Questionnaire interview, physical and gynecological examination, and laboratory investigations were used to elicit information. The prevalence of lower reproductive tract infections was 22.4%, upper reproductive tract infections 2.7%, and cervical dysplasia was very rare. Genital prolapse was present in 10%, 11% had a urinary infection, 27% were anaemic, 23% were hypertensive, and 54% were either overweight or obese. The predictors of common morbidities were assessed using regression analysis according to a pre-specified conceptual model. (*Afr J Reprod Health* 2004; 8[3]:188-197)

RÉSUMÉ

Les morbidités associées et gynécologiques chez les femmes omanaises jamais mariées. Afin d'évaluer la prévalence et les corrélats de la morbidité associée et gynécologiques chez les femmes omanaises, un échantillon nationalement représentative des femmes omanaises qui été sélectionné à travers un processus d'échantillonnage de probabilité stratifiée à stades multiples a été sélectionné (364 au total). Pour obtenir des renseignements, on s'est servi des interviews à questionnaire, des examens physiques et gynécologiques ainsi que des investigations de laboratoire. La prévalence des infections de la voie de reproduction inférieure était de 24%, des infections de la voie de reproduction supérieure était de 2,7% alors que la dysplasie cervicale était rare. 10% des femmes ont présenté le prolapsus génital, 11% avaient de l'infection urinaire, 27% ont été anémique, 23% ont été hypertendues et 54% avaient une surcharge pondérale ou étaient obèses. Les indices des morbidités ordinaires ont été évalués à l'aide de l'analyse de la régression d'après un modèle conceptuel pré-déterminé.

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KEY WORDS: *Morbidity, prevalence, community*

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Introduction

Gynecologic morbidity refers to the conditions of reproductive ill-health not related to a pregnancy episode.¹ Studying the prevalence of these morbidities helps in identifying the magnitude of such problems in the community. It identifies special at-risk groups to whom interventions should be directed as well as the most prevalent or serious problems. A community-based assessment also helps to identify the social context of morbidity.

The hospital-based setting for assessment of gynecologic morbidity may overestimate morbidity, as hospital attendants are usually those with complaints and, thus, cannot be representative of the community prevalence. There are also problems related to reliability and validity.² The confidentiality of patients seeking hospital service for a confidential cause, e.g., genital infection, may be violated if the study traced these women in their homes.³ Some studies included a reproductive morbidity module from a representative sample survey, e.g., a nested case-control study.⁴ Although this design has advantages, it has in particular a low response rate for validation and inadequate sampling. Other community-based studies were dedicated to the measurement of gynecologic morbidities.^{1,5} The former was a cross-sectional study in rural Egypt whereas the latter was a prospective study in India. Although the prospective design yields more information and enhances recall and can give incidence if follow-up was long enough, it is also more difficult and expensive.⁵ The sample size will inevitably be small, casting doubt on their representativeness.

Our aim was to assess the magnitude of gynecologic and related morbidities problems among ever-married Omani women and to identify their associated factors.

Subjects and Methods

This study is a part of the National Health Survey 2000 (NHS 2000) of the Sultanate of Oman, which consists of two major parts; the study of lifestyle risk factors and reproductive health. The sample for the survey was selected to be nationally representative. The survey adopted a multi-stage stratified probability sampling design. At first, all the ten regions of the Sultanate were chosen and the sample was distributed according to proportional allocation of the population size in each region. In each region, one or more willayate (provinces) were randomly chosen according to the size of the population in each region. Sixteen willayat were chosen (27%). Then, each willaya was stratified into two strata; the willaya's centres representing the urban area, and the remote areas, representing the rural areas. The urban-rural ratio was 2:1 (similar to the ratio of the 1993 National Census). The second stage was the random selection of enumeration areas (EAs), which were used during 1993 population census (about 80 households). Then, households were randomly selected. All ever-married women aged 15-49 years in the selected household were invited to participate in the survey. The total number of households selected was 1,968 with a total of 2,037 ever-married women, of which 1662 were non-pregnant at the time of survey and were eligible to report the gynecological morbidity symptoms questionnaire and to

have a gynecological examination. The response rate of completing the interview and filling the questionnaires was 88.9% and the response rate of visiting the health facility (in women's catchments area) was 82.1%, leading to 1,364 women subjected to data analysis.

The questionnaires used in this study were: (1) the household health status questionnaire, which covered the demographic data such as age, sex, marital status, educational status, and working status; (2) the reproductive health questionnaire, which covered fertility knowledge, attitude and practice; (3) the gynecological morbidity symptoms questionnaire, which consisted of women general health module, menstrual cycle module, abdominal pain module, vaginal discharge module, urinary complaints module, genital prolapse module, complaints during intercourse, and infertility module. In addition, physical examination form for gynecological morbidity, which included sections for general, abdominal and gynecological examinations, and the laboratory forms for the results of hemoglobin, urine routine and culture, vaginal and cervical swab, and Pap smear form.

Some laboratory samples were collected at the household, while others were collected at the health centre.

Specimens Collection at Households

To estimate the hemoglobin level, samples were collected in a container with EDTA anticoagulant. The samples were labelled and transferred immediately to the laboratories at the regional hospitals in cold boxes filled with ice. Then, specimens were

processed in cell dyne 1300, a multi-parameter hematology analyzer from Abbot Diagnostics. Hemoglobin was estimated by modified cyan-met hemoglobin method.

Specimens Collection at Health Facilities

Three types of vaginal specimens were collected from ever-married non-pregnant women aged 15-49 years old in the gynecology clinic by the gynecologist, in addition to blood and urine specimens. All samples collected at the health facilities were transported immediately to the laboratories at the regional hospitals.

- *High vaginal swab:* It was put in the Amie's transport media. The swabs were cultured onto sabouraud agar for *Candida* identification, the wet preparation was done for *Trichomonas vaginalis* and a gram stain was made from the swab and examined for the presence of clue cells as a proxy for bacterial vaginosis.

- *Cervical swab:* It was also put in the Amie's transport media. The swabs were cultured onto sabouraud agar and chocolate agar for growth of *Candida* and gonococci. *Gonococcus* was identified by colony characteristics gram stain reaction and positive oxidase test.

- *Cervical smear (Pap) smear:* was collected and a thin film was made, it was then fixed with spray (95% ethanol). The smears were stained with Papanicolaou stain.

- *Urine:* All participating females were

educated about aseptic collection of urine. Urine specimens were collected in sterile plastic universal containers with boric acid as preservative. For culture and sensitivity, urine was cultured in CLED (cystine, lactose, electrolyte deficient) plate, and colony counts were done. The organism was identified by colony characteristics, gram stain, biochemical methods and serological methods. Antibiotic sensitivity was done in DST (diagnostic sensitivity) agar by modified Stoke's disk diffusion method using ATCC controls.

TPHA blood specimens were collected in a plain container with no anticoagulant. The specimen was allowed to clot then clear serum was separated and subjected for the test.

Lower Reproductive Tract Infections (LRTIs)

Bacterial vaginosis was diagnosed by the presence of clue cells in vaginal swab. *Trichomonas* vaginitis was diagnosed by wet mounting, organism moving by undulating membrane and flagella. *Candida albicans* was diagnosed by a wet mount showing yeast buds or positive culture. Clinical cervicitis was diagnosed by the presence of a mucopurulent discharge in the cervix, while gonorrhoea was diagnosed by a positive cervical swab culture on chocolate agar.

Upper Reproductive Tract Infection (URTI)

This included infection of the uterus, fallopian tubes and ovaries and it was diagnosed if there was uterine tenderness alone, or with adnexal tenderness with

clinical cervicitis. Cervical ectopy was diagnosed if an abnormal layer that looked red on speculum examination replaced the surface layer of the cervix. Cervical cell changes were considered abnormal in the presence of mild, moderate or severe dysplasia (cervical intraepithelial neoplasia [CIN] I, II or III). Genital prolapse was diagnosed for anterior vaginal wall, posterior vaginal wall, and/or uterine prolapse when they descended below their normal position. Syphilis was diagnosed by a positive *Treponema pallidum* hem-agglutination test (TPHA). Urinary tract infection was diagnosed when the bacterial count was higher than 10^5 /ml of urine after culture. Anaemia was diagnosed when the haemoglobin level was lower than 12gm/dl for non-pregnant women and lower than 11gm/dl for pregnant women. Hypertension was diagnosed when the mean of two readings was ≥ 140 mmHg systolic or 90mmHg diastolic (Kortokoff phase 5) or if a woman reported that she had hypertension even if she had a normal blood pressure during examination. Prevalence was estimated based on adding up the subjects with self-reporting of systolic or diastolic hypertension (whether their blood pressure was normal or not when screened) to the subjects with mean of two readings of 140mmHg systolic blood pressure or 90mmHg diastolic phase 5 blood pressure or greater, i.e., either isolated systolic or diastolic hypertension. Obesity was diagnosed if the body mass index (BMI) ($\text{weight in Kg}/[\text{height in meters}]^2$) was $\geq 30.039.9\text{Kg/m}^2$. Morbid obesity was diagnosed if BMI was $\geq 40.0\text{Kg/m}^2$.

A pre-test was done to test the households, individuals, questionnaires and forms in order to obtain information about operational and organisational procedures

and to get an indication of general response to physical examination and specimen collection. A total of 120 households were selected from different areas in Muscat governorate. All the survey questionnaires and forms were interpolated, and were revised by experts. Measurements and specimens were also taken. The questionnaires, forms and some organisational procedures were adjusted after interviewers' and supervisors' debriefing session. The emerging problems, performance rates and general receptivity to the survey were analysed and discussed.

Training of Fieldwork Team

Twenty five teams covering all the Sultanate regions and consisting each of a health educator to interview the selected subjects, a nurse to take the physical measurements, a laboratory technician to draw the laboratory samples, a health inspector to transport the laboratory samples, a gynecologist to examine patients, and a field supervisor (statistician) to supervise and review the questionnaires during field operation. Teams headed by 10 regional research coordinators were trained on the methodology and steps of the survey for two weeks.

Statistical Analysis

Data entry was done using EPI INFO version 6. Data file preparation was completed in July 2000. Analysis of data was done using SPSS version 9 for windows. Group means were compared using ANOVA, while the likelihood chi squared test examined the distribution of data.

Multivariate analysis (several multiple logistic regression models) was conducted to test the effect of independent variables on the outcome variables. The independent variables used were age (years), educational level, residence (urban vs. rural), marital status (currently married, divorced or separated, or widowed), gravidity, recent delivery (during the last two years), IUD use, pills use, household workload (from women's point of view), personal hygiene behaviour in terms of protection in menstruation was taken as a proxy while excluding menstruating women who were amenorrheic as a result of breastfeeding or menopause (a score combining whether she is using tampons, cotton or piece of cloth to protect herself during menses and whether is washing herself with water and antiseptics, soap or only with water).

In view of the difficulty of asking about sexual activity, currently married women were asked about their husband's availability at home. Women were considered sexually active if their husband was living with them or coming to her at weekends. Women whose husbands were not coming for months because they were working abroad and women who were separated, divorced or widowed were considered sexually inactive.

The dependent or outcome variables tested in different logistic regression models were reproductive tract infections, genital prolapse, urinary tract infection, anaemia, hypertension and obesity. For categorical variables in logistic regression, one category was selected as reference category. Odds ratio was derived for each category expressing the magnitude of the increased risk in relation to the reference category. For continuous variables such as age and gravidity, the odds

ratio represents the percentage increase in the risk of morbidity condition tested for each unit increase in the independent variable or risk factor. The odds ratio for an independent variable in logistic regression was adjusted for other independent variables in the model. A *p* value of < 0.05 was considered statistically significant.

Results

Table 1 shows the characteristics of the study sample in Omani community. The age of ever-married women ranged from 15 to 49 years while 41% were within the 25-34-year age group. The mean age of women was 31.89 years. Only 16% completed secondary education or more. The majority was from urban areas (73.4%), currently married (91%) and sexually active (85%). Almost half of the sample had had six or more pregnancies (48.3%) and had had a pregnancy that ended within the last two years (47.2%). The majority of women reported that their household work was low to medium. In terms of personal hygiene, almost half of menstruating women were hygienic and the rest adopted a less hygienic behaviour.

The distribution of women according to their use of family planning (FP) methods is shown in Table 2. About 40% of currently married women were using a method of contraception. This figure did not change when women with available husbands were considered. The most common FP method used for both ever and currently married women was *depo provera*. Female sterilisation was relatively high.

Bacterial vaginosis was the most common disorder revealed by laboratory

investigation, while other types of vaginitis were less common (Table 3). About 3% had definite PID. Pap smear examination revealed no invasive cancer. About 10% had combined genital prolapse. Table 4 presents the percentage of women according to the presence of related morbidities. Eleven per cent had urinary tract infection, 27% had anaemia, and more than half of the sample was either overweight or obese. Hypertension was found among 23% of the examined women.

Considering the joint occurrence of morbidity conditions, we have tested the comorbidity of the seven reproductive health morbidities examined, namely, reproductive tract infection, cervical ectopy, genital prolapse, urinary tract infection, anaemia, hypertension and obesity. Most of the women were suffering from at least one category of gynaecologic or related morbidity (86%) and about one quarter of them had three categories or more. Only 14% were free from a morbidity condition (data not shown).

The results of regression analysis according to models of risk factors hypothesised for selected morbidity conditions are presented in Tables 5 and 6. The associated/risk factors were examined for the presence of at least one reproductive tract infection, upper or lower, found in 23% of the women including vaginitis, clinical cervicitis, definite PID and gonorrhoea (Table 5). The significantly associated factors contributing to this prevalence were vaginal prolapse and anaemia for all women and those with primary education and anaemia for the menstruating women. The regression analysis was repeated on the sub-sample of

menstruating women to examine the effect of personal hygiene behaviour, which was measured only for menstruating women. Low personal hygiene was not significantly associated with the presence of at least one reproductive tract infection but the association was positive. IUCD use was also positively associated with an increase in LRTI, though this was not statistically significant. There were no statistically significant associated variables contributing to the occurrence of any type of genital prolapse but anaemia and the presence of a low to medium workload was positively associated. Urban residence significantly predicted urinary tract infection for the menstruating sub-sample of women. The odds ratios for bacterial vaginosis and *Candida* vaginitis are provided in Table 5. Bacterial vaginosis was significantly higher in women with primary education and less hygienic standards. It had no association with IUCD use or sexual activity. Vaginal candidiasis was positively associated with university education and negatively associated with sexual activity and anaemia.

The likelihood of having anaemia was associated with age, education and residence (Table 6). With every increase of one year of age, the risk of anaemia increased by 2%. Rural residence increased such risk by 36%. Hypertension was significantly affected by age and obesity, while obesity was significantly associated with age, education and residence. Rural women were significantly protected from obesity (OR = 0.61, $p = 0.05$).

Discussion

This study has several advantages over other studies on reproductive morbidity. It is nation-wide, used an adequate sampling technique, explicit standardised criteria, and the response rate was adequate. The presence of morbidities relied not only on self-reported symptoms but all women underwent specialist gynecological examination and laboratory investigations.

However, some limitations were observed. For logistic reasons, we could not use a gold standard diagnostic test for bacterial vaginosis, although we used the single most reliable criterion. For the same reason, we could not look for chlamydial infection of the cervix. The effect of the morbidities on the quality of life has not been analysed, which would have been an asset to the findings.

The relatively low contraceptive use despite high parity raises some concern. Grandmultiparity carries definite adverse obstetric outcomes even if delivery was safely conducted.⁶ Family planning programmes should be designed to increase the awareness of people on the dangers of repeated deliveries.

The fact that 86% of the study population had one or more gynaecologic or related morbidities, and about one quarter had three or more conditions, is of great concern. This implies that Omani women suffer from reproductive ill health, thus necessitating a multifaceted intervention.

The prevalence of RTI, predominantly non-sexually transmitted infections, was quite high in this community. The associations of LRTI with genital prolapse and less hygiene standards are important although they lacked statistical significance. Bacterial vaginosis was the most prevalent

LRTI in this community. The significant positive relation to moderate or less hygiene can be an important health education message from primary care physicians and gynaecologists. The detection of BV is a chance to discuss all these simple preventive issues.

Our study could not find an association between sexual activity and BV possibly because we used a proxy of sexual activity not a direct tool. The lack of association with IUCD use is re-assuring to family planning providers because bacterial vaginosis has been linked to PID, which may be facilitated by the use of IUCD.⁷ It has also been associated with many adverse outcomes of pregnancy, namely, second trimester fetal loss, pre-term labour, premature rupture of membranes, intra-amniotic infection and postpartum endometritis.⁸ This high prevalence should be considered during antenatal care.

The positive significant relation of vaginal candidiasis to university education may be attributed to the association of many risk factors of candidiasis such as synthetic underwear and working outdoor in excess heat, which expose the vagina to extra-humidity and moisture. The negative relation to sexual activity may be attributed to the fact that semen increases vaginal pH, which is hostile to the growth of the yeast. Sexually transmitted infections (gonorrhea, trichomonas and HPV) were not prevalent in this community compared to western communities where these infections are highly prevalent.⁷ The prevalence of PID (2.7%) was not high. It is unfortunate that the association between chlamydia cervicitis and PID was not sought. Postpartum and post-

abortive infections should be uncommon in this community given the fact that in Oman, 95% of women deliver in hospitals.⁹ It would be interesting to assess the prevalence of chlamydia infection in a future study. The prevalence of epithelial cervical abnormalities is quite low. Human papilloma virus (HPV) was extremely low in this community, which is the strongest risk factor for cancer cervix.¹⁰ This has implications if a cervical cancer programme is to be contemplated. The predictive value of the test used is likely to be lower, as it depends on the prevalence.

The presence of genital prolapse is less common than in other studies¹ (10% versus 56%). This may be because of the differing prevalence of risk factors for genital prolapse in the two communities, such as workload and the conduct of deliveries. Moreover, the nature of workload is different as the populations are different. Workload is thought to increase the risk of developing genital prolapse by increasing intra-abdominal pressure.¹ The fact that medium-high workload was not associated with a significant increase in the risk of prolapse in this study has been explained by the fact that heavy workload may also be a pelvic muscular exercise.¹ The muscles of the pelvic floor are the main support of the uterus.¹¹ Women with less than high workload may not be training their pelvic floor muscles and, thus, may be at a higher risk of genital prolapse, and women with low workload do not have an increased intra-abdominal pressure. The lack of association with age and number of pregnancies does not agree with Younis et al.¹

This may be explained by the fact that most deliveries in Egypt take place at home

while majority of deliveries in Oman (95%) are in hospital. There is also a racially determinant incidence of prolapse.¹² Different populations have different qualities of connective tissue strength and pelvic muscle development. An increase in the intra-abdominal pressure is the single most important determinant of genital prolapse.¹²

The prevalence of anaemia was unacceptably high, although the figures are much lower than other studies.¹ The positive association with age may indicate that Omani women cannot rely on nutritional intake alone to build their iron stores. Other risk factors were not assessed, e.g., the prevalence and duration of breastfeeding. Iron supplementation during pregnancy and throughout lactation must be considered for all Omani women, given their high total fertility rate (for the five years preceding the survey, it was 5.7 in rural areas, 4.5 in urban, and 5 for the overall sample) and low contraceptive prevalence (50% of ever-married women ever used contraceptive method).⁹

The prevalence of hypertension in such young aged sample is also of concern especially as it was higher than other studies.¹ Our study had different criteria for hypertension. The highly positive association with obesity is especially worrisome due to the high prevalence of the latter. The association with age was significant. Another risk group is the combined oral contraceptive users, albeit not statistically significant, perhaps due to the small numbers of users of the latter. The higher numbers of pill users in the study by Younis et al¹ might have allowed a statistically significant relation. The dire consequences of hypertension are well known. The adverse effects on pregnancy are of particular concern

due to the high fertility of the population.

Obesity is the "mother of all problems" in this community. Obesity was the highest risk factor for hypertension in the study. It has also been linked to many adverse obstetric outcomes such as pre-eclampsia, gestational diabetes, thromboembolism and postpartum hemorrhage.¹³ Urban women, especially those with low educational attainment, constitute a high-risk group that should be targeted for a diet campaign. Another group is pill users, who have to watch their diet. To conclude this discussion, it is imperative to remember that descriptive studies generate hypothesis but cannot verify it. Hence, the interpretation of the estimates must be cautious.

Conclusion and Recommendations

Reproductive morbidities are quite prevalent in this community. Despite the availability of health care, barriers to access have to be explored and women helped to express their suffering. Among reproductive tract infections, bacterial vaginosis and candida are the most prevalent. The contribution of the former to adverse obstetric outcomes has to be studied. Sexually transmitted infections and PID are rare in Omani community. Anemia is unacceptably prevalent. Strategies to increase iron stores during pregnancy must be considered. Women must also be advised about the detrimental effect of repeated pregnancies on iron stores. Obesity and hypertension are very prevalent and preventive efforts are badly needed.

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