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Gender differences and factors associated with treatment-seeking behaviour for infertility in Rwanda

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BACKGROUND: This study examines perceptions of infertility causes, treatment-seeking behaviour and factors associated with seeking medical care in an urban infertile population in Rwanda, as well as the response of health providers.

METHODS: Between November 2007 and May 2009 a hospital based survey was conducted among 312 women and 254 male partners in an infertile relationship.

RESULTS: Infertility causes based on a medical diagnosis were mentioned by 24% of women and 17% of men. Male infertility awareness was low in both sexes with 28% of men and 10% of women reporting male-related causes. Seventy-four per cent of women and 22% of men had sought care for their infertility in the past. Seeking treatment in the formal medical sector was associated with higher income, being married and infertility duration of more than 5 years in both sexes. In women, higher education and being nulliparous and in men blaming oneself for the infertility was also associated with seeking formal medical care. Participants reported a wide array of treatments they received in the past, often including ineffective or even harmful interventions.

CONCLUSION: Health authorities should invest in improving information, education and counselling on issues pertaining to causes and treatments of infertility, and in drawing up guidelines for the management of infertility at all levels of health care.

Key words: infertility / treatment-seeking behaviour / resource-poor countries / gender / Rwanda

Introduction

Infertility is highly prevalent in sub-Saharan Africa, affecting up to one-third of couples in certain areas, but has not received the attention it deserves due to limited resources, policies aimed at reducing population growth and the high cost of modern infertility treatment (Larsen, 2000; Vayena *et al.*, 2002; Aboulghar, 2005; Boivin *et al.*, 2007; Ombelet *et al.*, 2008). The inability to conceive has severe consequences for couples, especially for women, in countries where female identity, social status and security depend on the ability to produce offspring (Gerrits, 1997; Sundby, 1997; Dyer, 2002; van Balen and Bos, 2009). Although it is unlikely that modern assisted reproductive technologies at current cost will become available in the public services of resource-poor countries, at least in the medium term, a call has been made by several authors to improve information, education and counselling on causes of and treatments for infertility and

to draw up guidelines for the management of infertility at all levels of healthcare (Sundby *et al.*, 1998; van Balen and Gerrits, 2001; Folkvord *et al.*, 2005). In order to do this, information about prevailing perceptions and treatment-seeking behaviour is needed.

Previous research in Mozambique and Gambia has shown that many infertile couples engage in prolonged and relentless care-seeking often without the desired result (Gerrits, 1997; Sundby *et al.*, 1998). In most developing countries, the formal medical sector has very little to offer to these couples and often ineffective treatments without prior systematic investigations are tried out with limited success. As a result, some patients search for explanations in witchcraft, poisoning or religious factors with traditional healers (Leonard, 2002). Many patients consult both the formal medical and traditional health-care sector draining their already scarce resources. Men are culturally often not construed as infertile and therefore absent themselves from seeking treatment for infertility (Upton, 2002; Barden-O'Fallon, 2005a, b; Folkvord *et al.*, 2005).

Most of the research on infertility in Africa has been anthropological and mainly conducted in Western or Southern Africa. There are virtually no data on treatment-seeking behaviour for infertility and prevailing perceptions on its causes in the East-African region. Furthermore, we know very little about the factors associated with seeking care in the formal medical sector for both men and women, and very few descriptions of the response of health-care providers have been reported. Detailed knowledge of these factors could assist in developing the appropriate strategy for helping infertile couples in some African countries.

We therefore conducted a survey among 312 infertile women and 254 male partners presenting themselves for infertility investigations at a research clinic in Kigali, Rwanda. We obtained a detailed history from each participant including where and when they had sought care for infertility, the interventions they received and their perception of the causes of infertility. Associations between care-seeking in the formal medical sector and selected factors (socio-demographics, reproductive history, relationship/household characteristics and perceptions) were analysed. Perceptions and treatment-seeking behaviour were compared between both sexes.

Materials and Methods

Study population and setting

Between November 2007 and May 2009, an infertility research clinic was opened at the Kigali University Teaching Hospital (KUTH) in Rwanda, which set out to offer a basic package of infertility investigations, free of charge, to 300 couples. Initially, study participants were recruited among women attending the gynaecological consultations at KUTH and the district hospital of Muhima, the largest secondary referral hospital for gynaecological problems in Kigali. Recruited women spread the word of the research clinic, which resulted in two-thirds of the enrolled participants being recruited through word of mouth. To be eligible for participation, women needed to be between 21 and 45 years of age, residing in Kigali, willing to undergo HIV testing and having had sexual intercourse at least once in the last 2 weeks. Refusal to participate in the study did not influence access to further services. Infertility was defined as having had regular unprotected intercourse for 1 year or more without conception with at least one regular partner. After inclusion, all women invited their male partners with a written note from the research clinic to participate on a separate occasion.

The study was approved by the National Ethics Committee of Rwanda and the Ethics Committee of the Ghent University Hospital.

Study measurements and variables

The purpose of the study was explained to potential participants in their local language (Kinyarwanda) and eligibility criteria were checked. All participants provided written informed consent before study procedures took place. Women were interviewed by a female nurse and male partners by a male medical officer about socio-demographic characteristics, reproductive history and their perception of causes of infertility using a structured questionnaire. The question about what participants thought had caused their infertility was open-ended and categorized after data collection. Belief in poisoning, bewitching or demons was categorized as traditional beliefs and belief in God's will or God's punishment as religious beliefs. The category medical causes applied when one of the following terms was used by the participant: ovulation disorders, abnormal tubes, semen abnormalities, abnormal menses, myomas, hormonal problems, post-

partum or post-operative complications and advancing age. Lifestyle factors include sexual behaviours, alcohol and stress. All medical concepts, which remained vague such as 'some disease' or which were clearly fabricated by the participant such as 'too many hormones', 'blood incompatibility' were categorized under own medical construct. Participants were asked to report on the investigations and treatments received for each medical visit in the past.

Statistical analysis

Data collected during interviews and laboratory investigations were entered once, verified and cleaned using MS Access 2000 (Microsoft, Seattle, USA). Intercooled Stata 9.2 (Stata Corporation, College Station, TX, USA) was used for statistical analysis. Differences between proportions and medians were compared using Chi-squared tests (test for trend in case of ordered exposure categories) and Mann–Whitney U-tests, respectively. Variables with a moderate association with the outcome (P-value less than 0.2) in bivariate analysis were selected and retained in multivariable models when they were significantly associated or affected the association (odds ratio (OR)) between the other predictors and the outcome with 10% or more.

Results

Demographic characteristics

Of a total of 339 potentially infertile women who presented to the clinic, 312 were confirmed eligible and enrolled. Male partners of 81% of the infertile women (254 partners) agreed to participate.

The median age was 30 years (inter quartile range (IQR) = 27–35 years) for the infertile women and 34 years (IQR = 30–40 years) for the infertile men (data not shown). Twenty-eight per cent of the infertile women and 41% of the infertile men had received more than primary education. Seventy per cent of the infertile women and 100% of the infertile men was employed at the time of the survey. Sixty-seven per cent of women and 21% of men were earning less than 1.25 USD a day, and 9% of women and 22% of men were earning more than five USD a day.

Perception of causes of infertility

When asked what they perceive as the cause of their infertility, 25% of women mentioned traditional or religious beliefs, 25% named a cause based on a medical diagnosis, 6% blamed HIV/STIs, 11% fabricated their own medical concept and the remaining had either no idea (30%), blamed contraceptives (4%) or diverse lifestyle factors (2%) (Table I). Men were less likely than women to mention traditional beliefs (11% versus 18%, $P = 0.025$), were less likely to construct their own medical concepts (5% versus 11%, $P = 0.02$) and more likely to say I don't know (48% versus 30%, $P < 0.001$) than women. Fifty-three per cent of the women blamed only themselves for the infertility versus 14% of males ($P < 0.001$). When indicating a female cause of infertility, men often mentioned that they had children in another relationship.

Characteristics of treatment-seeking behaviour in the past

Table II lists the different features of fertility treatment-seeking behaviour for participating women and men. Of the 312 women and the 254 men, 227 (73%) and 56 (22%) had sought care for their infertility,

Table I Perceived causes of infertility as reported by male and female participants.[a]

Variable	Female (n = 308), n (%)	Male (n = 252), n (%)	P-value
Traditional beliefs[b]	55 (18)	28 (11)	0.025
Religious beliefs[c]	25 (8)	17 (7)	0.54
Medical cause	73(24)	44 (17)	0.07
STI/HIV	20 (6)	13 (5)	0.5
Contraceptives	13 (4)	7 (3)	0.36
Lifestyle	6 (2)	8 (3)	0.35
Medical concept constructed by participant	34 (11)	14 (5)	0.02
No concept	93 (30)	122 (48)	<0.001
The person perceived as having the problem			
self is cause	163 (53)	35 (14)	<0.001
partner is cause	14 (5)	130 (52)	<0.001
both are cause	15 (5)	35 (14)	0.002
Not mentioned	116 (38)	52 (21)	0.014

[a]Answers were given to an open-ended question: 'What, according to you, is the cause of infertility in your relationship?' and were afterwards categorized. Multiple responses were possible.
[b]Belief that infertility is caused by poisoning, bewitching and demons.
[c]Belief that infertility is caused by God's will or punishment.

respectively (Table II). Eleven per cent (24/227) of these women and 5% (3/56) of these men had only consulted a traditional healer; the remaining women and men had visited the formal medical sector (private, public and non-governmental not-for-profit organization (NGO)). Forty per cent of women and 47% of men first sought help in the public sector. Twenty-five per cent of women and 7% of men had consulted the traditional healer first (P = 0.003). Women started looking for help after a shorter time interval (median of 2 versus median of 3 years, P = 0.002), they paid more visits (median of 4 versus median of 2 visits, P < 0.001), sought help more frequently from different sources (P < 0.001) and paid more frequently at least one visit to the traditional healer (43% versus 14%, P < 0.001), compared with men. Fifteen per cent of women reported to have consulted the traditional healer for a general medical problem at least once, whereas 43% reported to have done so for infertility. Half the infertile women who had sought care spent twice their monthly income on infertility investigations and treatment and for 25% of women this was six times their monthly income (data not shown).

Predictors of treatment-seeking among infertile women

Independent predictors for seeking care in the formal medical sector for women were: higher education (adjusted odds ratio (AOR): 4.04, 95% CI: 1.89−8.64), higher income (AOR: 2.14,95% CI: 1.20−3.82), being married (AOR: 2.00, 95% CI: 1.16−3.42), being nulliparous (AOR: 2.78, 95% CI: 1.30−5.95) and being in an infertile relationship for at least 5 years (AOR: 1.96, 95% CI: 1.11−3.49) (Table III).

Predictors of treatment-seeking among infertile men

For the men in an infertile relationship, having a higher income (AOR: 5.65, CI: 1.34−23.82), being married (AOR: 4.51, CI: 1.95−10.42), having infertility for at least 5 years (AOR: 3.22, CI: 1.41−7.33) and blaming oneself for the infertility (AOR: 3.61, CI: 1.76−7.43) were associated with seeking care in the formal medical sector (Table IV).

Treatments offered by formal medical sector

Of the 203 women who consulted the formal medical sector, 25% reported to never having received any tubal investigations (either by hysterosalpingography (HSG) or by laparoscopy). Women mentioned having received a wide variety of treatments in the formal medical sector, mostly medical treatments including oral tablets, injections, suppositories and vaginal tablets. Clomiphene citrate was the most popular medical treatment followed by some kind of hormonal treatment, which includes steroids, contraceptives, estrogens and progestogens. Women often received a cocktail of drugs including antibiotics, female hormones, non-steroidal anti-inflammatory drugs (NSAIDs) and steroids. Some women reported receiving injections into the uterus. Half the men received medical treatments, mostly testosterone or clomiphene citrate. Twenty per cent of women had undergone surgery as treatment for their infertility including tubal surgery, myomectomy and ovarian cystectomy. In most cases surgery was performed through laparotomy. Twenty-five per cent of women received clomiphene citrate at least once. Of the 57 women who had received clomiphene citrate in the past, the majority (49/57, 84%) reported a regular menstrual cycle, and 30% of these women we diagnosed a bilateral tubal block on the hysterosalpingography/laparoscopy performed in the research clinic.

Discussion

Sex differences in the perception of causes of infertility, in treatment-seeking behaviour and in the factors associated with seeking modern medical care for infertility were identified. A wide variation of causes was reported by men and women for their infertility. Traditional beliefs (poisoning, bewitching, etc.) and religious beliefs (God's will) were often cited the cause of infertility, though more by women than men. Only a quarter of the participants named explanations based on a medical diagnosis and often they constructed their own medical concept, despite the fact that the majority (65%) of women had previously been exposed to modern medical health care. These findings complement existing research on this subject from other sub-Saharan countries (Sundby, 1997; Dyer *et al.*, 2002a, b; Richards, 2002). In-depth interviews with infertile women in South Africa highlighted the discrepancy between biomedical information rendered by patients and their personal concept on this information (Dyer *et al.*, 2002a, b).

In a region where infection-related causes of infertility dominate, there is very little awareness of the link of infertility with high-risk sexual behaviour and sexually transmitted infections (STIs). In our population, very few men and women thought that their infertility could be caused by STIs including HIV. The same was noted by Barden-O'Fallon among women and men in rural Malawi (Barden-O'Fallon, 2005a, b).

Table II Characteristics of treatment-seeking behaviour among 227 women and 56 men who sought care for infertility.

Variable	Female (n = 227), n (%)	Male (n = 56), n (%)	P-value
Only visited traditional healer	24 (11)	3 (5)	0.23
Duration of infertility before first treatment, median years (IQR)	2 (1–3)	3 (2–6)	0.002
Duration treatment was sought, median years (IQR)	3 (2–6)	3 (2–5)	0.69
Type of health sector first accessed			
Private	52 (23)	18 (32)	0.15
Public	90 (40)	27 (47)	0.24
Traditional healer	57 (25)	4 (7)	0.003
NGO	27 (12)	8 (14)	0.63
Number of different health sectors accessed			
1	99 (44)	39 (68)	<0.001
2	84 (37)	17 (30)	
3	38 (17)	1 (2)	
4	5 (2)	0 (0)	
Number of visits, median (IQR)	4 (2–10)	2 (1–4)	<0.001
Total expenditure on infertility care, median USD (IQR)	73 (27–270)$	91 (22–200)$	0.85
At least 1 visit private sector	103 (46)	27 (47)	0.7
At least 1 visit public sector	160 (71)	33 (58)	0.1
At least 1 visit traditional healer	98 (43)	8 (14)	<0.001
Health sector usually accessed for general medical problem			
Private	93 (41)	27 (48)	0.32
Public	177 (78)	39 (70)	0.19
Traditional healer	35 (15)	3 (4)	0.048

NGO, non-governmental not-for-profit organization.

Both men and women are unlikely to attribute infertility to the male partner, partly explaining why only 22% of men had ever sought care for infertility. These results are in keeping with reports from other African countries with the exception of South Africa where male infertility awareness was unexpectedly high (Fiander, 1990; Sundby, 1997; Sundby et al., 1998; Dyer et al., 2004). Free and easy access to a referral hospital with an organized and welcoming research team might have positively influenced the high participation rate of male partners in our study (81%).

The gender differences, which we found in perceptions towards infertility and in treatment-seeking behaviour indicate that in Rwandese society the woman is blamed, not only by her partner but also by herself, for the couple's difficulty with childbearing. She carries the greatest burden of stigmatization and suffering caused by infertility. Educational campaigns need to make an effort to reach both women and men to address these issues.

In addition to the public services, the private sector and the traditional healer are both important alternative sources of first help. It has been demonstrated repeatedly that traditional healers attract people to come to them for infertility treatment (Sundby et al., 1998; Barden-O'Fallon, 2005a, b; Folkvord, 2005; Stekelenburg et al., 2005). Care is often sought from both the traditional and the formal health sector, as is also the case in our population (Dyer et al., 2002a, b). These findings indicate the need to involve healthcare staff from both formal and informal sectors when investing in education of infertile couples and the community about infertility.

The analysis of factors associated with seeking formal medical treatment suggests that in addition to factors related to reproductive history, educational level, income and perceptions are predicting treatment-seeking behaviour. A similar finding was reported from a study in Malawi where educated women were more likely to seek treatment for infertility (Barden-O'Fallon, 2005a, b). In our study, we also found that men who blame themselves for infertility are four times more likely to have consulted medical services. A significant limitation of this study is that the study design cannot ascertain whether these men are more likely to seek care or whether their perception has changed after contact with the medical services.

Rwanda is a poor and overpopulated country with 77% of its population living under the poverty threshold of 1.25 USD a day. Management of infertility is not a priority for the public health sector. Basic infertility investigations such as HSG and semen analysis are not widely available and often of poor quality. None of the hospitals has a unit dedicated to infertility. Laparoscopic surgery is only available in the capital. The curative health-care services in the public sector are provided with a 10% co-payment fee, the rest is paid by the community-based health insurance. However, the need to travel long distances to access infertility investigations adds considerably to the cost. The finding in our study that infertile men and women with higher income are more likely to seek care indicates that financial constraints play a role in treatment-seeking behaviour for infertility.

Our study findings were obtained from urban couples, willing to undergo infertility investigations and may therefore not be

Table III Predictors of having sought care in formal medical sector for women (*n* = 312).

	Per cent having sought medical care in formal sector	Crude odds ratio	95% CI	Adjusted odds ratio[a]	95% CI
Socio-economic characteristics					
Age					
21−29	60.3				
30 and above	68.5	1.43	0.84−2.29	1.60	0.87−2.91
Education					
Up to primary	56.4				
More than primary	87.4	5.33	2.69−10.58	4.04	1.89−8.64
Religion					
Non-Muslim[b]	64.8				
Muslim	75.0	1.68	0.69−4.09	NI	
Income[c]					
<1 dollar/day	56.5				
At least 1 dollar/day	75.6	2.39	1.43−3.99	2.14	1.20−3.82
Relationship/household characteristics					
Marital status					
Not married	50.0				
Married	76.7	3.29	2.03−5.35	2.00	1.16−3.42
Polygamous union					
No	66.9				
Yes	46.4	0.43	0.20−0.94	NI	
Children in the house					
None	66.7				
At least one	64.1	0.89	0.55−1.44	NI	
Reproductive history					
Parity					
Had at least one pregnancy >28 weeks	51.0				
Never had a pregnancy >28 weeks	78.6	3.54	2.16−5.79	2.78	1.30−5.95
Living children					
At least one	48.5				
None	72.8	2.84	1.73−4.66	1.69	0.79−3.60
Duration infertility					
<5 years	58.8				
5 years or more	71.1	1.72	1.07−2.75	1.96	1.11−3.49
Perception[d]					
Blames partner only	63.8				
Blames self for infertility	65.7	1.09	0.68−1.74	NI	

NI, variables not selected for inclusion into final regression model.

[a]Variables with a moderate association with the outcome (*P*-value less than 0.2) were selected and retained in final regression model when they were significantly associated or affected the association (odds ratio (OR)) between the other predictors and the outcome with 10% or more. Final model included age, education, marital status, income, parity, living children and duration infertility. Infertility type was not included since it is collinear with parity.

[b]Includes all other religions and non-believers.

[c]16 missing values, *n* = 296.

[d]4 missing values, *n* = 308.

generalized to the country level. It is possible that findings on perception towards infertility and treatment-seeking behaviour for infertility are quite different among a community-based sample of rural infertile couples. The socio-economic status of infertile women in our study is not different from the general female population in Kigali whereas the socio-economic status of the infertile men seems higher than the general male population in Kigali (DHS 2005).

There is some hope that in the future assisted reproductive techniques could be made more affordable but further research is

Table IV Predictors of having sought care in formal medical sector for men (n = 254).

	Per cent having sought medical care in formal sector	Crude odds ratio	95% CI	Adjusted odds ratio[a]	95% CI
Socio-economic characteristics					
Age					
21–29	12.9				
30 and above	23.4	2.07	0.91–4.66	1.01	0.36–2.82
Education					
Up to primary	15.9				
More than primary	28.2	2.07	1.12–3.82	NI	
Religion					
Non-Muslim[b]	22.4				
Muslim	9.7	0.37	0.11–1.27	NI	
Income[c]					
<1 dollar/day	9.4				
At least 1 dollar/day	22.3	2.78	0.81–9.54	5.65	1.34–23.82
Relationship/household					
Marital status					
Not married	10.1				
Married	30.4	3.89	1.93–7.83	4.51	1.95–10.42
Polygamous union					
No	22.6				
Yes	0.0			NI	
Children in the house					
None	20.6				
At least one	21.0	1.03	0.55–1.91	NI	
Reproductive history					
Infertility type					
Secondary	13.2				
Primary	30.9	2.94	1.57–5.52	1.74	0.69–4.38
Pregnancies with current partner					
At least one	12.5				
None	23.7	2.17	0.96–4.90	1.79	0.59–5.41
Duration infertility					
<5 years	13.8				
5 years or more	28.2	2.45	1.30–4.61	3.22	1.41–7.33
Perception[d]					
Blames partner only	13.7				
Blames self for infertility	40.0	4.19	2.21–7.92	3.61	1.76–7.43

NI, variables not selected for inclusion into final regression model.
[a]Variables with a moderate association with the outcome (P-value less than 0.2) were selected and retained in final regression model when they were significantly associated or affected the association (odds ratio (OR)) between the other predictors and the outcome with 10% or more. Final model included age, income, marital status, infertility type, pregnancy with current partner, duration infertility and perception. n = 236.
[b]Includes all other religions and non-believers.
[c]18 missing values, n = 236.
[d]2 missing values, n = 252.

needed in how to implement simplified methods of infertility diagnosis and treatment in developing countries (Ombelet, 2009). Health authorities could in the meantime invest in improving information, education and counselling on causes and treatments of infertility.

In order to prevent inappropriate treatments, guidelines for the management of infertility at all levels of healthcare should be drawn up and included in the curriculum of doctors, nurses and midwifes. In health-care centres, the main focus should be on history taking and counselling (with emphasis on need to involve men) and some basic investigations such as syphilis and HIV testing can be performed. If a real problem of infertility (1 year of regular unprotected intercourse without conception) exists, the couple needs to be referred

to the district hospital for HSG and semen analysis. After completing the investigations, the couple should receive comprehensive information on the findings and possible treatment. In our experience, couples appreciate the information, even if no treatment can be offered as understanding the problem often helps them to accept it.

All this can prevent exploitation, potentially damaging practices and waste of the savings and can alleviate the stigmatization and enormous suffering of the infertile patient.

The link between high-risk sexual behaviour, HIV/STIs and infertility deserves special attention. Currently family planning or HIV/AIDS prevention programmes promote dual protection against unintended pregnancies and HIV/STIs. Other authors have already suggested that, since infertility is one of the most feared conditions in sub-Saharan Africa, extending the concept of dual protection to include the safeguarding of fertility ('triple protection') could be viewed as a unique selling point (Brady, 2003).

Authors' roles

The study was conceived and designed by N.D., M.T. and Jvd.W. N.D., J.V., G.A., N.D. analysed the study data and drafted the article. S.L. and Jvd.W. assisted with data analysis and interpretation of data. W.O. assisted with interpretation of data. S.L., W.O., A.G., J.V., Jvd.W. and M.T. revised the article critically.

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