

# Clinical, epidemiological and socio-cultural aspects of infertility in resource-poor settings. Evidence from Rwanda

Nathalie Dhont

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Supervisor: Marleen Temmerman (1)

Co-supervisor: Janneke van de Wijgert (2)

(1) Department of Uro-gynaecology, Ghent University

(2) Amsterdam Medical Centre, Amsterdam Institute for Global Health and Development, University of Amsterdam

Public defence: 15 April 2011

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Infertility is highly prevalent in sub-Saharan Africa (SSA), 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. In SSA most of the infertility is caused by infections acquired through sexual transmission (sexually transmitted infections, STIs) or during childbirth and operative procedures in unhygienic circumstances. Knowing the behaviour and the infections which predisposes one to be infertile can guide the design of cost-effective prevention measures. One of the infections which have been linked to infertility is HIV. HIV infected persons are up to 40% less fertile through several mechanisms, some not entirely understood. Some limited data have shown that HIV infection rates are up to three times higher among infertile couples than among fertile couples.

At present the formal health sector in resource poor countries has very little to offer to infertile couples. Modern artificial reproductive technologies which are the only solution for many cases of infertility are only available to the very rich. Studies in certain Africa countries have shown that infertile couples, especially the women, desperately look for treatment from different sources including traditional healers and spend a lot of money in the process.

The inability to conceive has severe consequences for the couples, in countries where gender identity, social status and security depend on the ability to produce offspring, and women often carry the largest burden. Interviews with these couples have revealed high levels of social isolation and stigmatisation, marital problems, financial problems and depression.

Since infertility has not been studied at all in Rwanda this work took an explorative approach studying different aspects of the problem including clinical, epidemiological and socio-cultural aspects. More specifically we examined predictors and determinants for different types of infertility (female and male factor, primary and secondary infertility) and their relative contribution, including HIV and other reproductive tract infections (RTIs), past sexual and contraceptive behaviour, obstetric history and lifestyle factors. Secondary objectives included the evaluation of perceptions of infertility

causes, treatment-seeking behaviour and factors associated with seeking medical care as well as the response of health providers, consequences of female and/or male factor infertility for men and women and the outcome of infertility investigations, and an 18 month follow-up of infertile women and their partners in Rwanda.

Between November 2007 and May 2009 sexually-active women aged 21-45 year presenting infertility problems at the infertility clinic of the Kigali University Teaching Hospital (n=312), and fertile controls of women who recently delivered (n=312) were surveyed together with their male partners in an unmatched case-control study. Participants were interviewed about socio-demographic characteristics, medical history, obstetric history, sexual behaviours, sexual functioning and were tested for HIV and RTIs. Infertile couples received also basic infertility investigations and were followed up over an 18 month period. In addition, five focus group discussions were held with selected infertile participants.

Among the STIs examined, HSV-2 and HIV infection were the most important determinants of infertility for both men and women. For women sexual violence in the past was the third most important determinant. All variables related to STIs and risky sexual behaviour were stronger associated with tubal factor infertility than non-tubal factor infertility. This pattern was not observed for male factor infertility. Finally, lifestyle factors such as smoking, alcohol and weight are not related with infertility in Rwanda. Some previously unknown obstetric history predictors were identified for secondary infertility such as lack of prenatal care during the last pregnancy, unwanted pregnancies and stillbirths. A history of unwanted pregnancies was strongly associated with secondary infertility despite the fact that very few women reported an induced abortion. Obstetric events, HIV infection and other STIs all contribute equally to secondary infertility in Rwanda.

We found a threefold higher HIV prevalence among infertile couples, with one third of the infertile couples having at least one HIV infected partner. Especially the infertile women with a history of a pregnancy in the past (about half of all infertile women) had high HIV infection rates and often reported high risk sexual behaviour in the past and in the present. Infertile men were much more likely to report extramarital partners over the last year than fertile men. Very few women in both groups reported extramarital partners.

After performing basic infertility investigations in 224 urban infertile couples, we found a high prevalence of tubal disease in the women (70%) and abnormal semen parameters in the men (64%). Pregnancy rates (16%) were low after conventional therapy. When asked about the cause of their infertility, only one in four of the participants named explanations based on a medical diagnosis, often they constructed their own medical concept and cited witchcraft or God as the cause of their infertility, despite the fact that the majority (65%) of women had previously been exposed to modern medical health care. There is very little awareness of the link of infertility with high risk sexual behaviour and sexually transmitted infections (STIs). Both men and women are unlikely to attribute infertility to the male partner. Women looked for care earlier, more often and from different sources and were more likely to visit traditional healers than men.

Participants reported a wide array of treatments they received in the past, often including ineffective or even harmful interventions.

The investigation of the psycho-social consequences of infertility in Rwanda demonstrated severe suffering, similar to what is reported in other resource-poor countries. Although women carry the largest burden, the negative repercussions of infertility for men, especially at the level of the community, are considerable. Whether the infertility was caused by a female factor or male factor was an important determinant for the type of psycho-social consequences suffered.

In conclusion, the prevention of HIV and HSV-2 has the potential to prevent an important amount of cases of tubal factor infertility in SSA. Reduced sexual violence and better post-rape care has a role to play in infertility prevention, especially in areas with high prevalence of this behaviour. The study on secondary infertility indicated that improved obstetric, neonatal and paediatric care will also have a considerable impact on the rates of infertility and/or childlessness. The high prevalence of past unwanted pregnancies and HIV infection among infertile couples indicates that efforts to prevent infertility should join hands with efforts to prevent HIV and unwanted pregnancies. The safe sex messages used in family planning and HIV programs should teach that unsafe sex does not only increase the risk of acquiring HIV and unintended pregnancies, but can also lead to infertility.

The high HIV prevalence among infertile couples indicate that voluntary HIV counselling and testing of infertile couples may identify new HIV infections and increase opportunities for HIV care and prevention. On the other hand, the link between HIV and infertility represents an opportunity and indeed an obligation to put infertility services in place. Sperm washing techniques can prevent sexual transmission in discordant couples and treating infertile couples effectively can prevent them from spreading HIV infection while 'looking elsewhere' for offspring.

The study of perceptions and treatment-seeking behaviour of infertile couples identified a need to improve information, education and counselling on causes and treatments of infertility. Guidelines for the management of infertility on all levels of healthcare should be drawn up and included in the curriculum of doctors, nurses and midwives to avoid unnecessary or harmful treatments and to improve counselling on infertility. Since pregnancy rates are low with conventional therapy a call for affordable IVF in resource-poor countries is made.

Overall, we can conclude that there is an urgent need for a more holistic approach towards reproductive health services in SSA, one that recognises the importance of reproductive failure and one that provides an integrated package of different services.