

## Conference Paper

# Outcome of Intra Uterine Insemination for HIV Serodiscordant Couple

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## Abstract

**Introduction.** HIV serodiscordant couple who wish to have offspring but fear of disease contagious prohibited them from conceived naturally. Intrauterine insemination without having direct sexual contact is one of the method to achieve this wish. This study was aimed to evaluate the outcome of intrauterine insemination in HIV serodiscordant couple. **Material and Methods.** Retrospective analytic study was done. HIV serodiscordant couple who have been treated with intrauterine insemination from January 2010 until June 2014 in Halim Fertility Centre Medan was included in this study. **Results.** There were 27 cycles of intrauterine insemination from HIV serodiscordant couple. The clinical pregnancy rate were 33.3%. None of the babies or mother after deliveries have HIV positive. **Conclusion.** Intrauterine insemination in HIV serodiscordant couple appears to be effective and safe method to achieve pregnancy.

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## 1. Introduction

Approximately 37 million people are living with human immunodeficiency virus (HIV) worldwide and >80% of HIV-infected individuals are of childbearing age [1]. Several studies have reported the presence of HIV in semen [2]. Sexual activity is the principal mode of contamination. If sexual transmission of HIV is to be prevented, condoms must be used systematically during intercourse [1-3]. Thus, couples of reproductive age in which the man is HIV-1 infected and who wish to have a child with their own gametes can only resort to medically assisted procreation (MAP) because unprotected intercourse at the time of ovulation goes against prevention campaigns [3]. HIV serodiscordant couple who wish to have offspring but fear of disease contagious prohibited them from conceived naturally [4]. Intrauterine insemination without having direct sexual contact is one of the method to achieve this wish [5]. A study of a nationally representative sample of 2,864 HIV-infected adults receiving medical care in the United States showed that 28%–29% of HIV-infected men and women desire children in the future [2,6].

Many HIV positive people of reproductive age are getting married and wish to have children without infected. Couples with one HIV infected partner, i.e. HIV discordant couples, had a high risk of horizontal transmission of the virus to their uninfected partner. As a consequence, these couples were advised to always use condoms. In

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couples involving a seropositive man not using condoms, the transmission risk to the uninfected woman has been estimated to range between 0.15 and 0.2% per sexual intercourse but may be much higher when other sexually transmitted diseases coexist or when the viral load is high [7]. It would be possible for an HIV infected male have a children without the risk of HIV transmission if HIV free spermatozoa could be obtained from his semen. One way of allowing HIV serodiscordant couples, where the male is infected, to conceive their biological children while limiting the risk of HIV transmission is the use of assisted reproduction after semen processing using the sperm washing method [8].

Semprini et al. (1992) were the first to report the results of an insemination program with spermatozoa obtained after a specific sperm preparation method, to allow serodiscordant couples with an HIV-1 infected male partner to have a child while reducing the risk of female contamination [9,10]. Since then, sperm washing techniques have substantially changed the paradigm of fathering children in serodiscordant couples for male HIV infection [11].

The aim of this study is to evaluate the outcome of intrauterine insemination in HIV serodiscordant couple.

## 2. Material and Methods

### 2.1. Serodiscordant couple

The study comprised a retrospective review of patient medical records from a program based at Halim Fertility Center Medan. Data was collected from 20 HIV serodiscordant couple (seropositive men and seronegative women) who have been treated with intrauterine insemination (IUI) from January 2010 until June 2014. A total of 27 IUI cycles were performed. The inclusion criteria of serodiscordant couples was HIV seropositive men had to be in good general health and clinically asymptomatic, with a CD4 count greater than 200 mm<sup>3</sup> and a stable blood viralload for at least 4 months. Men with azoospermia or severe oligospermia were excluded because in these cases sperm preparation methods were not applicable. Female partners were tested for HIV and were required to be seronegative. All women were aware that their partners were HIV seropositive. Couples had to be using condoms and practising safe sex.

### 2.2. Method of Sperm Preparation

Semen samples were collected by masturbation into a sterile container after 3 days of sexual abstinence. After 30 min liquefaction, standard analysis of semen samples was carried out according to the World Health Organization (WHO) guidelines (WHO, 2010). An improved washing method was used to collect HIV free spermatozoa from the semen of HIV positive males. Diluted semen was layered over a Percoll solution with a continuous density gradient of 45-90% and centrifuged at 350 g for 15-20 minutes. This step will separate motile spermatozoa from non-sperm cells, immotile spermatozoa and seminal plasma. Briefly, the spermatozoa pellet was add with 2 mL

medium and centrifuged at 300 g for 8-10 minutes followed by adding 1 mL medium to pellet and resuspended gently. Suspension was divided in two, half was frozen with liquid nitrogen with our standard freezing protocol and kept in our sperm tank and the other test for HIV RNA and DNA. Sperm will be used for insemination if HIV RNA and DNA appeared to be negative.

### 2.3. Human Immunodeficiency Virus Detection in Blood

To detect HIV in blood, we used western blot/ Enzyme Immunoassays (EIA). The technique of EIA was blood collected 10 ml from the patient's vein into a sterile 10 ml tube. Blood is collected in a purple-top tube (with anticoagulants, e.g., EDTA). Dilute the specimen in the specimen buffer and put it in a microwell plate containing HIV antigen already bound to the plate. Incubate the plate as per protocol and then wash as indicated. Add antihuman immunoglobulin-enzyme conjugate, which will react with the HIV specific antibody, if present. Incubate. Wash the plate, add the enzyme substrate, and incubate as prescribed. Add a stopping solution to terminate the enzyme reaction, and read the absorbance of the solution in a spectrophotometer. A positive reaction has occurred if the specimen in the specimen well changes color or becomes colored, which indicates the presence of HIV-specific antibody in the specimen. This action is best read quantitatively with an EIA plate spectrophotometer.

### 2.4. Intrauterine Insemination Protocol

Whenever IUI was scheduled, we stimulated our patients with Clomiphene citrate (from day 2 till day 6 of the cycle). We used gonadotrophins starting on day 2 or 3 of the cycle, using 75 or 150 U of gonadotrophins. Ovulation stimulation was monitored by ultrasound to measure the follicle diameter and endometrium growth, from day 9 of the cycle until the follicle reached 18-20 mm in diameter and also followed by LH kit urine test. Human chorionic gonadotrophin (hCG, 10000 IU) was administered IM when lead follicles reached 18-20 mm in diameter. IUI procedure was performed only once, 24 or 36 hour after hCG administered.

### 2.5. Data analysis

Processing and analyzing data were using SPSS 17 (Statistic Package for Social Science) software. Data were analyzed by using Chi square test.

## 3. Results

There were 27 cycles of intrauterine insemination from HIV serodiscordant couple.

From Table 1, The mean (SD) age of woman was  $29,3 \pm 2,92$  with basal FSH  $6,76 \pm 5,9$ . The mean number of motile spermatozoa inseminated was  $5,19 \pm 1,63$ .

Variable	Mean ± SD
Maternal age	29,3 ± 2,92
Basal FSH in woman	6,76 ± 5,9
Motile inseminated spermatozoa x 10 <sup>6</sup> /ml	5,19 ± 1,63

TABLE 1: Mean (SD) age of woman, basal FSH, and motile inseminated spermatozoa according to IUI results.

Variable	Data
Couples	20
IUI cycles	27
Pregnancy rate per IUI cycle (%)	33,3
Miscarriage rate per pregnancy (%)	22.2
Delivery	25.6

TABLE 2: Results of an IUI program in serodiscordant couples with an HIV -infected male partner.

From 27 IUI cycles, the pregnancy rate per IUI cycle was 33,3% then miscarriage rate per pregnancy was 22,2%. The pregnancies resulted in 25,6 deliveries (Table 2).

From Table 3, None of the babies or mother after deliveries have HIV positive.

#### 4. Discussion

For serodiscordant couples in which the man is HIV infected, prevention of HIV sexual transmission requires systematic use of condoms during intercourse. This has the consequence of inducing artificial sterility in these couples.

Semprini et al. pioneered insemination programmes with “washed sperm” in serodiscordant couples with an HIV-1 infected male partner in 1992, an era when study of viral load in blood and sperm was not possible. The feasibility of an insemination programme in serodiscordant couples in order to obtain a child without contamination of the female partner was confirmed in 1998 [9]. Barnes et al. (2014) stated that in serodiscordant couple, IUI and IVF seem effective and safe based on the literature. They stated that Male and female candidates for insemination seem to have pregnancy rates comparable to the general fertility population. Miscarriage rates seem similar to those for HIV-seronegative subfertile couples for IUI but are higher for ART. Seropositive men with unaffected partners have pregnancy and live-birth rates with ART comparable to seronegative couples [12].

In this study, we found clinical pregnancy rate from 27 cycles of IUI procedure was 33,3%. It was higher than previous study. There were no mothers and babies get infected from HIV after deliveries .

	HIV (+)	HIV (-)
Mother	0	20
babies	0	7

TABLE 3: Outcome of status HIV in woman and babies after deliveries.

Bujan et al. (2004) demonstrated that the efficiency of an IUI program with prepared and virologically tested spermatozoa in serodiscordant couples with an HIV-1-infected male partner, allowing the couples to have children without transmission of the virus to the female partner. They found that clinical pregnancy rate from 213 cycles of IUI procedure was 17,4% [3]. Bujan et al. (2007) also stated that sperm washing and IUI are highly effective in enabling serodiscordant couples with an HIV-1-infected male partner to have a child [2].

## 5. Conclusion

Intrauterine insemination in HIV serodiscordant couple appears to be effective and safe method to achieve pregnancy.

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