

The Effect Of Gardnerella Vaginalis On Infertility And Pregnancy Of Albino Rats

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Citation

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Abstract

The effect of Gardnerella vaginalis (GV) on infertility and pregnancy of albino rats were studied. Forty male and female rats were inoculated intra-vaginally with 0.02ml of GV containing 10^5 CFU/mL. Twenty infected females were mated with infected and non-infected male rats respectively in separate large cages for a period of one month. Also, ten gravid rats were similarly inoculated and observed till delivery. The result of the study indicated a 20-40% reduction in impregnation and 70-80% decrease in the number of offsprings produced among the infected rats. Also, the survival rates of the offsprings after 7 days reduced drastically among the infected rats. There were cases of abortion and delivery of feeble/underweight rats among the infected pregnant rats. This study shows that GV could be a factor worthy of consideration in the cases of infertility and pregnancy associated complications in rats. Further investigation is recommended to determine the effect of this organism on infertility and pregnancy complications in human subjects.

INTRODUCTION

The normal vagina is colonized predominantly by Lactobacillus which are believed to afford protection against microbial pathogens. De-population of lactobacilli from normal vaginal flora and over-growth of Gardnerella vaginalis (GV) and other anaerobic species including Bacteroides bivius, B. disieus, Porphyromonas species and Mycoplasma hominis is reported to result in bacterial vaginosis (BV)^{1,2,3}. That GV is particularly associated with BV has been reported^{4,5}.

The involvement of microorganisms in infertility and pregnancy associated problems has long been widely described^{6,7,8,9,10,11,12}. Although some workers have reported isolation of GV from semen samples¹³, its actual involvement in infertility and or pregnancy-related complications has not yet been very explicitly highlighted. This study attempts to determine the possible effect of GV on infertility and pregnancy complications in albino rats.

MATERIALS AND METHODS

SELECTION OF ALBINO RATS

Forty male albino rats of about 3 months old weighing between 120-150g were randomly selected from the animal house of University of Nigeria Teaching Hospital (UNTH), Enugu. Similarly, another forty females were selected. Also,

fifteen pregnant rats were randomly selected from the same animal house.

INFECTION AND MATING OF ALBINO RATS

Twenty female and ten male albino rats were inoculated with 0.02ml of Gardnerella vaginalis (GV) containing 10^5 CFU/mL intra-vaginally and intra-muscularly. Four weeks later, after the establishment of infection through culture technique, ten infected matured female rats were mated with ten infected matured male rats in a large cage. In another similar cage, ten infected matured females were also mated with ten healthy matured males. In the third cage, ten healthy matured females were mated with ten healthy matured males to serve as control.

The rats were monitored on weekly basis until delivery. The number of rats impregnated, number of offsprings produced and survival rates of the offsprings after seven days were determined and recorded.

All the rat groups were reared under the same condition with commercially available rat feed and watered ad libitum.

DETERMINATION OF THE EFFECT OF ON GRAVID RATS

Ten pregnant rats were inoculated intra-vaginally with 0.02ml of GV containing 10^5 CFU/mL suspension. The

pregnant rats were fed and watered ad libitum. The control groups were five pregnant rats inoculated with 0.02ml of sterile distilled saline without GV.

All the pregnant rats were observed until delivery to determine the number of healthy rats delivered, their weight and possible pregnancy complications.

ETHICAL CONSIDERATION

The research and ethical committee of the University of Nigeria Teaching Hospital, Enugu approved the conduct of this study on the agreement that good laboratory practice for handling of experimental animals be observed.

RESULTS AND DISCUSSION

The result of the study showed that the mating of matured female rats infected with 0.02ml of Gardnerella vaginalis (GV) containing 10⁵ CFU/mL, with matured male rats similarly infected with GV resulted in reduction in the number of impregnation, offsprings borne and the survival rate compared with the control rats. The same was observed for the infected matured female rats mated with matured healthy male rats (Table1).

The drastic reduction in the number of impregnations from 100% in the control group to 60-80% in the infected rats tend to suggest that GV infection may have some association with the infertility of the studied rats. Previous studies have associated microbial infections with cases of infertility. A significantly high incidence of genital infection was reported among male patients with idiopathic infertility than their fertile controls⁸. Also, two separate researches reported the isolation of Ureaplasma urealyticum, Atophobium vaginae, and GV, involved in the aetiology of BV, respectively from infertile men with oligospermia and a 39 year old woman with tubarian sterility^{6,11}. Similar findings have also been reported by other workers^{10,12}.

It is apparent from the result of this work that infection with GV could pose untoward effect on the formation of fetus and survival of the new borne rats. Although the definite effect of this organism in human subject is yet to be elaborated, it is very likely to pose serious challenges, going by the presentation in the albino rats studied. This obviously demands further clarification to determine the probable role of this organism in infertility in humans.

This study also revealed that 20% of the GV infected gravid rats had abortion and at least two offsprings delivered per mother were feeble/underweight (Table 2). This observation

supports earlier findings that microbial infections are incriminated in causing sporadic spontaneous abortion⁷. It further corroborates other previous reports in which GV has also been associated with preterm birth, preterm rupture of membrane, chorioamnionitis and amniotic infection^{14,15}.

Generally, it does appear that the probable role of GV infection in infertility and pregnancy may not be contrary to the established adverse effects of sexually transmitted infections(STI). This calls for special attention since hitherto, GV have not been among the targeted organisms suspected to be critical in infertility and pregnancy complications. This study therefore underscores the urgent need for further research on the role of GV in infertility and pregnancy in both experimental models and human subjects.

Figure 1

Table 1: Delivery and survival pattern of the offsprings of rats infected with

Experimental rats	No. of impregnations	Average No. of offsprings borne	Average No. of offsprings surviving after 7 days
10 infected female rats mated with 10 infected males	6	2	1
10 infected female rats mated with 10 uninfected males	8	3	2
10 uninfected female rats mated with 10 uninfected males	10	10	9

Figure 2

Table 2: Delivery and survival pattern of the offsprings of pregnant rats infected with

Experimental rats	Observations within 1 month		
	Average No. of healthy Rats delivered per mother	Average No. of underweight/feeble Rats delivered per mother	No. of rats that had abortion
10 pregnant rats infected with <i>G. vaginalis</i>	5	2	2
10 uninfected pregnant rats (Control rats)	9	0	0

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