PREVALENCE OF CANDIDIASIS AMONG PRE AND POST VESICO-VAGINAL FISTULA REPAIR PATIENTS AT MARYAM ABACHA WOMEN AND CHILDREN HOSPITAL SOKOTO IN NIGERIA

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ABSTRACT
A study was conducted in order to assess the menace of candidiasis in a less privileged and predisposed women or group in Sokoto state Nigeria. The study was conducted from January to December 2014, to determine the prevalence of vaginal Candidiasis among patients with pre and post vesico vaginal fistulae (VVF) repair. A total of 200 high vaginal swap (HVS) samples were collected using random sampling technique from pre and post VVF repair patients 100 each. The samples were cultured on sabouraud dextrose agar and incubated at 35ºC for 48-72 hours. Germ tube test was conducted on positive cultures as confirmatory test for Candida albicans. One hundred and twenty (120) (60%) samples were positive which comprised 20 (20%) samples from pre VVF repair patients and all 100 (100%) samples from post VVF repair patients. Out of 120 positive cultures; 68 (56%) were germ tube test positive, whereas 52 (44%) were negative. This study indicates that out of 200 samples only 68 (34%) of both pre and post VVF repair patients attending Maryam Abacha Women and Children Clinic during the study period were having candidiasis, whereas 60 (25%) were having other fungal infections, but only 20 (20%) of pre VVF repair patient have candidiasis, the rest 80; (80%) have no any fungal infections. The present findings indicate that vaginal candidiasis is more prevalent in post VVF repair patients than pre VVF repair patients. Besides the severe social consequences, overlooking the presence of pathogenic microorganisms in pre and post VVF repair patients may lead to further complications such as severe candidiasis, pyelonephritis and pelvic inflammation. Therefore, urgent treatment, prevention and control measures are needed to reduce the menace of these poverty related infections.

Keywords: *Candida albicans*, vaginal candidiasis, Vesico vaginal fistula (VVF), patients.

1. INTRODUCTION

Vaginal *candidiasis* also known as genital *candidiasis;* is a fungal infection of the vagina and the conditions which is known *by* other names such as vaginal yeast infection and vaginal candidiasis. Candida is a genus of yeasts and is the most typical cause of fungal infections with *Candida albicans* being the most common isolated species. Candida can cause infections such as thrush and yeast infections, to name a few. These can wreak havoc on those suffering with recurrent infections, drastically reducing quality of life and affecting many everyday daily activities (WHO, 2016). The vaginal area naturally produces yeast. The optimal conditions for yeast to thrive are in a moist and warm environment. Pregnancy can result in an increase in vaginal secretions which often contain sugar, and yeast feeds off sugar. This makes it the perfect environment for yeast to grow and flourish, and for yeast infections to develop (Donna 2016). Genus *Candida* which is responsible for candidiasis contains a number of species of which *C. albicans* is by far the most frequently encountered in candidiasis (Dorner *et al*., 2010).

Under normal condition, *Candida* species occur in small number in the alimentary track, mouth, nails, in the vigina and on the skin as normal flora, but if immunodeficiency syndrome occurs; under certain conditions, candidiasis may present form of the symptoms (Dalela, *et al*., 2003).

Nearly 75% of all adult women in Kenya have had at least one genital yeast infection in their life time and also more than three quarter of women have at least one episode of vaginal candidiasis during their life time, while a few women get frequent recurrences (Garthwaite and Harris, 2010). *Candida albicans* is implicated in more than 80% of cases: *Candida glabrata, C. krusei a*nd *C. tropicalis* account for the remaining percentage. The clinical presentation of candidiasis is itching and soreness of the vagina and vulva with a cloudy white discharge. In some cases there may be itching and redness with watery discharge and the pH of vaginal fluid is usually normal, between 3.5 and 4.5 (Sohel, *et al* 1998).

Vesico vaginal fistula (VVF) is a devastating childbirth injury that results in the abnormal fusion between the urinary bladder and the vagina (Agba, *et al.*, 2002). It is the commonest type of abnormal connection (fistula) seen in gynaecological practice in developing countries (Andrew, 1999). It has been an old menace to mankind and has always been a constant source of misery to the women affected (Carlsen. 2001). Incidence and prevalence estimates of obstetric fistula are generally based on

self-reporting, personal communication with surgeons, studies by advocacy groups and reviews of hospital services in which the relevant denominators are unknown or unreported. Recent estimates that between 50 000 to 100 000 women worldwide develop obstetric fistula each year. However, these estimates are based on scanty data and need to be updated (WHO, 2014). The relative rarity of obstetric fistula and the geographical remoteness of the areas where most cases occur mean that there are few reliable estimates of the number of women affected. A recent review of 19 studies attempted to estimate the global prevalence and incidence of obstetric fistula but could find very few studies that used a nationally-representative sample or were conducted in South Asia (Adler, 2013). Data on the incidence of iatrogenic fistula – a complication of obstetric or gynaecological surgery – are also scarce (Adler, 2013). The commonest cause of VVF is obstructed labour which, if not relieved on time, could result to death and only the "lucky" ones survive by paying the prize of acquiring VVF, still born infants and constant dripping of urine down their legs. Other attendant effects are wetting of their clothes and accompanying smell. Most communities consider these women as outcast (Haley, 2002)

In Nigeria about 80% of VVF cases are due to unrelieved obstructed labour during child birth which is directly related to the custom of early marriage (Ojanuga and Ekwempu 1999). The organisms exist in small amount in the vagina (Warnock and Richardson 1990). Symptoms appear when the number of *Candida albicans* becomes larger in relation to the microorganisms that normally inhabit the vagina (Pappas *et al*. 2003b). Microscopically, *Candida albicans* usually appear as cells that reproduce by budding however in affected areas filamentous pseudohypae may be seen (Lanchares and Hernandez, 2000).

Several studies of this nature had been conducted in Kaduna, Kano and many other states in northern and southern Nigeria. Therefore, as a result of lack of information on candidiasis in pre and post VVF repair patients in Sokoto state that this study objective seeks to evaluate the prevalence of a *Candidiasis* among pre and post VVF repair patients attending Maryam Abacha Women and children hospital in Sokoto state. This will provide a base line data for further research, investigation and treatments of candidiasis in the area of study.

2. MATERIALS AND METHODS

2.1 Study Population

This study was a hospital-based sectional study which was conducted at the Maryam Abacha Women and children hospital in Sokoto state Nigeria from August to October 2015. The Centre is located in the premises of Sokoto town and is the only major health facility for the treatment and management of VVF cases from Sokoto, kebbi and Zamfara states Nigeria. The Centre has a 100 bed capacity and has conducted surgical repairs of 2500 VVF cases since its inception in 28th June, 1997. Women who visited the VVF Centre for medical attention during the study period, only those who were receiving pre and post VVF repair treatments were enrolled into the study.

2.2 Sample Collection

Ethical and study protocol approval was granted by the chief medical director (CMD) of the Maryam Abacha Women and Children Hospital Sokoto, Sokoto state Nigeria. The approval was on the agreement that patient anonymity must be maintained, good laboratory practice/quality control ensured, and that every finding would be treated with utmost confidentiality and for the purpose of this research only**.** A total of two hundred (200) samples were collected using random sampling technique from patients attending Maryam Abacha Women and Children Hospital Sokoto, using sterile swap stick from the vagina of pre VVF repair and post VVF repair patients. Immediately or within one hour after collection, the samples were inoculated for culture and identification following standard procedure (Chessbrough, 2000).

2.3 Incubation of Samples

The sterilized Petri dishes containing solidified Sabouraud's dextrose agar (SDA) media were removed from the refrigerator and surface dried in an oven at drying temperature of 35ºC and was allowed to cool. Each swab sample was re-enriched with 4ml of physiological saline solution and incubated at 37ºC for 6 hours. A loopful of the suspension was inoculated onto the surface of the SDA and incubated at 37ºC for 48 to 72 hours. The culture was observed for small whitish creamy spherical colonies which indicate the growth of yeast cells, which are found at the surface of the Agar. For further confirmation staining techniques and germ tube test were carried out according to the method described by Ochei and Kolhatkar (2000).

2.4 Gram Staining Reaction

From the culture plates, smear of each colony was prepared on the slide and Gram stained. The Gram-stained slide was then observed under a microscope using higher powered objectives (x40) for yeast like cells, bud and yeast like cells with Pseudohyphae of *Candida* as described by Chessbrough (2000).

2.5 Statistical analysis

The results obtained of the prevalence of pre and post VVF repairs patients were analysed using Percentage table and Bar chart methods to compare the differences between pre and post VVF repair patients.

3. RESULTS

The results obtained for incidence rate of vaginal candidiasis among pre VVF repairs and post VVF repairs patient attending Maryam Abacha Women and children Hospital Sokoto is presented in Table 1.

Table1: Incidence of *Candida albicans* among VVF pre & post repairs patients in Sokoto, Nigeria.

Health status	No. Examined	No. of Growth	No. +Ve	No.-Ve	% +Ve	%-Ve
Pre VVF	100	20	20	80	20	80
Post VVF	100	100	48	52	45	55
Total	200	120	68	132	65	135

Key:
VVF= Vesico-vaginal fistula. +Ve = Positive , -Ve = Negative.

From the 200 samples collected from both pre and post VVF repair patients; 120 (60%) were positive for candidiasis and 80 (40%) were negative for candidiasis. Only 20 out of 100 samples from the pre VVF repair patients were positive for candidiasis the rest 80 has no any form of fungal infection. All the 100 samples from post VVF repair patients were positive. Furthermore, out of 120 positive cultures only 68 (57%) were germ tube positive, whereas 52 (43%) were germ tube negative. The result shows that 68 (34%) were having positive candidiasis while 132 (66%) have other fungal infections as illustrated n Figure 1.

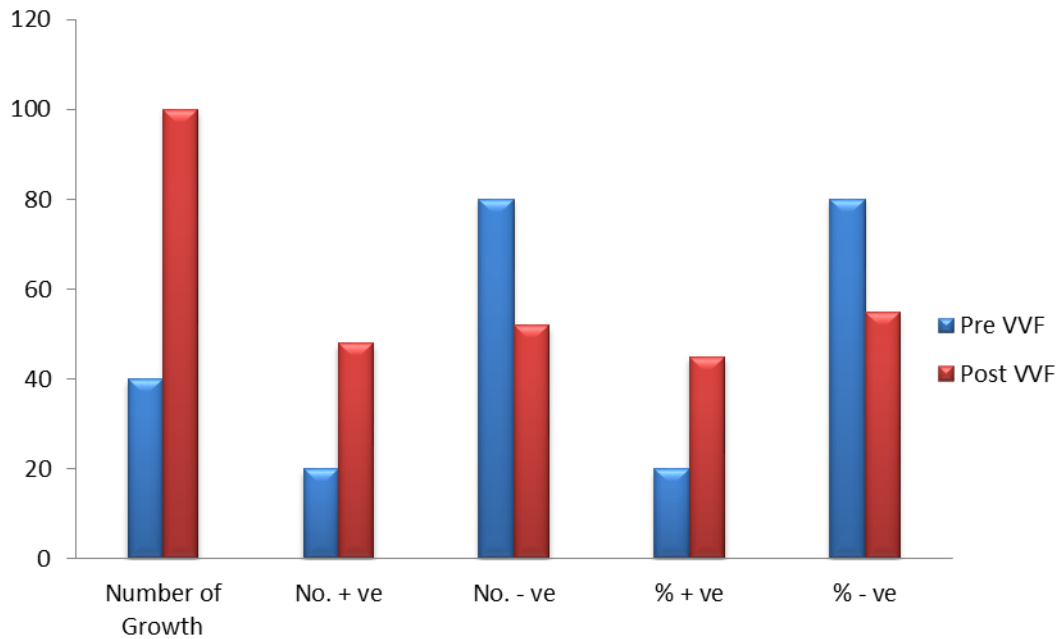

Figure. 1: Distribution of *Candida albicans* among Pre VVF and post VVF repair patients

4. DISCUSSION

A total of 200 samples were collected from pre and post VVF repair patients attending Maryam Abacha Women and children Hospital Sokoto. Post VVF repair patients reveals high incidence of candidiasis among the selected VVF patients population. Post VVF repair patients are more susceptible to *Candida* infection this may be due to that fact that the vagina is warm, moist and damp which is

conducive for the growth of *Candida albicans* as reported by Harley (2002) and Kees (2006). While the pre VVF patients are less susceptible because of the continuous flow of urine which flushes the microbes away from the vaginal track and also providing an acid environment which effect the growth of *Candida* (Ekanem *et al.*, 2010).

Another important reason for the decline in the prevalence of *Candida albicans* in pre VVF repair patients is the fact that, they are not sexually active therefore, a sexually promiscuous husband or man cannot serve as an agent of transmitting candidiasis to his wife or woman. This is in contrast to post VVF repair patients who are sexually active (Harley, 2002). These findings did agree with previous work of Edward (1999), and Yahaya and Auta (2006), who worked on microbes associated with urogenital system of Vesico vaginal fistula (Candidiasis inclusive) in Sokoto state, Nigeria and reported that: "*Candida albicans* which accounted for 60% of the total high vaginal swab (HVS) samples analysed; is a small yeast that forms filaments called Pseudohyphae when cultivated in laboratory media. *Candida albicans* is often present in the vagina even of healthy persons; where it is referred to as normal flora, where it lives without causing disease. As body defences are compromised or when changes occur in the microbial population, *Candida albicans* flourishes and causes many forms of candidiasis (Paige, 2010.) "

Yahaya and Auta (2006) also reported that 32% of the microorganisms associated with urogenital system of Vesico virginal fistula (VVF) patient in the north western Nigeria is due to *Candida albicans.* The author (Yahaya and Auta, 2006) advised that specimen of the vaginal discharge should always be cultured in their study 36 out of 102 patients appeared microscopically positive for *Candida albicans* on culture. They also recommended that primary isolation is aided by using selective medium such as Sabouraud agar or nutrients agar containing 1% glucose and broad spectrum antibiotics to inhibit bacterial growth (Warren, 2001).

Similar study by Ameh (2008) reported that Up to 32.2% of the micro-organisms isolated from high vaginal swap of VVF patients at two tertiary hospitals in Sokoto are *Candida albicans*. Infection with *Candida albicans,* a fungus that requires glucose for growth incident rises during the menstrual calycles phases. Such infection occurs twice as often in pregnant females as in non-pregnant females (Walsh and Dixon 1996). It also commonly affect users of hormonal contraceptives and patients who are diabetic and those receiving systematic therapy with broad spectrum antibiotics (incidence may reach 75%) poor personal hygiene, chemical irritation or allergic reaction to hygiene sprays detergents, clothing or toilet paper, retention of foreign body, such as shampoo are good predisposing factors. (Sunday-Adeoye, 2009))

In the United States *Candida* species was the most common cause of fungal infections in immunocompromised persons (De Ridder 2009). Clinical and autopsy studies have confirmed the marked diseases in the incidence of disseminated candidiasis, reflecting a parallel increase in frequency of candidemia. This increases a multifactor in origin and reflects increased recognition of fungus. A growing population of patients at risk (e.g. patient undergoing complex surgical procedures, and the improved survival rates among patients with underlying neoplasm or collagen vascular disease and patients who are immunosuppressed (Pappas *et al.* 2003a).

In north-western Nigeria, 32% of isolates from vaginal swab of VVF patients have candidiasis (Yahaya and Auta 2006). Mortality rates associated with these infections have not improved over the past years and remain in the range of 30-40% systemic candidiasis causes more case fatalities than any other systemic mycosis (Ibrahim, *et al.*,2000) More than a decade ago, investigators reported the enormous economic impact of systemic candidiasis in hospitalized patients in Nigeria . Candidiasis is associated with considerable prolongation in hospital stays (70 & 40 days in comparable patients without fungemia (Kabir *et al.*, 2003).

Symptoms of candidiasis are abnormal vaginal discharge ranging from a slightly watery, white discharge to a thick white discharge (like cotta cheese). Pain with intercourse or urination are common, redness of vulva, itching, burning irritation of vagina, most male partners of women with years infection do not experience any symptoms of the infections, a transient rash and burning sensation of the penis, however have been reported after intercourse if condoms were not used. The management of serious and life threatening invasive candidiasis remain severely hampered by delays in diagnosis and lack of reliable diagnostic methods that allow detection of both fungemia and tissue invasion by *Candida* species (Pappas *et al.* 2003a).Besides the severe social consequences from the irritating stench of urine that often result in ostracizing the affected women from the community (Tunçalp *et al.*, 2014).

5. CONCLUSION

In this study, it was found out that the prevalence of candidiasis is higher in post VVF repair patients (68% positive) than in pre VVF repair patients (20% positive) in women attending Maryam Abacha women and children hospital in Sokoto metropolis. Therefore, a full record of the women's history has been taken and the predisposing factors were identified in order to control the rate of the transmission.

6. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. To prevent re- infections and to ensure better management of the condition, it is advisable to report or admit acute cases in the hospital for treatment
2. The sample should always be taken for culture, microscopy and germ tube tests
3. Both sexual partners should have a personal and environmental hygiene and avoid sexual promiscuity.

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