PREVALENCE OF CANDIDIASIS INFECTION IN RURAL AREA OF EKITI STATE, NIGERIA

[1]JAYEOBA Kola Bamidele, [2] OLOWOYEYE Ebenezer Adeola and [3] OLANIYI Ifeoluwa Tolu
[1&2]Department of Basic Medical Sciences,
[3]Department of Health Information Management,
[1,2&3]College of Health Sciences and Technology, Ijero-Ekiti Nigeria

Abstract
Candidiasis is a yeast infection (a type of fungus) called Candida. Some species of Candida can cause infection in people; the most common is Candida albicans. Candida albicans is an organism that normally makes a quiet home for itself on the skin, mouth, gastrointestinal tract, vagina, and penis. It may also infect the bloodstream or internal organs such as the liver or spleen. Occasionally the yeast multiplies uncontrollably, causing pain and inflammation. If it reaches the bloodstream or heart, candidiasis can kill. This study aimed to determine the prevalence of candidiasis in rural areas of Ekiti State, Nigeria. A retrospective descriptive study was conducted using simple random technique to select one thousand five hundred and fifty (1550) patients attending Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria, from January to December 2020 tested for Candidiasis. Medical records of suspected patients tested for Candidiasis infection were collected from the medical records of the Health Information Management department. SPSS was used to analyze data. Data were expressed in frequencies, percentages, and bar charts. Statistical significance was set at $p<0.05$. 605 (39.03%) of the patients were male while 945 (60.97%) were female. Out of a total of 1550 patients, 55 were identified as positive, resulting in an overall prevalence of 3.55%. 18 (2.96%) of the male subjects were positive while 38 (3.92%) of the female subjects were positive. Age group 41-50 had highest prevalence of candidiasis infection of 1.42%. The tests for all subjects in the age group 1-20 years were negative. The prevalence of candidiasis was low. Diagnosed candidiasis was higher in females than males. Nutrition, lifestyle, poor hygiene, and self-medication differences may have contributed to the higher prevalence of candidiasis among females than males. Therefore, people should be sensitized on how to prevent candidiasis in rural areas of Ekiti State.

Key Words: Candidiasis, Infection, Rural, Yeast, Oropharyngeal

Introduction

A yeast (a type of fungus) known as Candida causes the fungal infection known as candidiasis. Some species of *Candida* can cause infection in people; the most common is *Candida albicans*. *Candida* normally lives on skin and inside the body, such as the mouth, throat, gut, and vagina, without causing problems. Candida can cause infections if it grows out of control or if it enters the body deeply (CDC, 2022).

There are various types of candidiasis. Thrush (Oropharyngeal Candidiasis) is the Candida yeast infection that develops in the mouth and spreads to the throat. Oral thrush most often occurs in infants and toddlers. It causes white or yellowish bumps to form on the inner cheeks and tongue (Karen, 2019). It is also common in the elderly and people with weakened immune systems**.** Adults undergoing cancer treatment, taking medications such as corticosteroids and wide-spectrum antibiotics, wearing dentures, and suffering from diabetes are also at a higher risk of contracting it (Neha,

2021). When thrush occurs in males, it can affect the head of the penis and the foreskin. It can lead to inflammation of the head of the penis, known as balanitis. Symptoms include an itchy rash, red skin; swelling, irritation, and itching around the head of the penis; lumpy discharge under the foreskin; or pain when urinating and during sex (Daniel, 2018). It is fairly common and affects approximately 3–11% of males during their lifetime. Balanoposthitis involves both the glans and the foreskin and occurs in approximately 6% of uncircumcised males. Balanoposthitis occurs only in uncircumcised males (Wray et al., 2023).

Vaginitis is an infection of the female genitals often caused by yeasts and other fungi. The overgrowth of Candida in the vagina is known to stimulate it, making it a common infection of the female genital tract (Emeribe et al., 2015; Mbakwem-Aniebo et al., 2020). Trichomonas vaginalis, Gardnerella vaginalis, and Chlamydia trachomatis, or a combination of these various microorganisms, may also cause it. Candida spp. often cause vulvovaginal candidiasis (VVC), characterized by itching, erythema, and curd-like vaginal discharge (Rathod et al., 2012; Nelson et al., 2013; Mbakwem-Aniebo et al., 2020).

Some parts of the world have documented an increase in the prevalence of serious fungal infections. For instance, a survey of the epidemiology of sepsis in the USA revealed a threefold increase in the incidence of fungal sepsis between 1979 and 2000 (Oladele and Denning, 2014; Rhee and Klompas, 2020). Oropharyngeal colonization is found in 30%–55% of healthy young adults, and *Candida* species may be detected in 40%–65% of normal faecal flora. At least one bout of VVC affects three out of every four women during their lifetime (Jose, 2020), with postmortem diagnosis often leading to a low index of suspicion and treatment. According to estimates, invasive aspergillosis and invasive candidiasis account for 4% and 2% of all hospital deaths, respectively. According to estimates, invasive aspergillosis and invasive candidiasis account for 4% and 2% of all hospital deaths, respectively (Oladele et al., 2014; Ocansey et al., 2019). The reviewed articles published from 1991 to 2019 showed that one hundred forty-four out of 287 patients were identified with Candida infection, of which 151 isolates were obtained. Patients isolate Candida albicans 109 (72.1%), Candida glabrata 21 (13.9%), Candida krusei 8 (5.2%), Candida tropicalis 5 (3.3%), Candida africana 3 (1.9%), Candida parapsilosis 3 (1.9%), and C. dubliniensis 2 (1.3%). One hundred and fifteen (40.6%) of patients with *C. africana* candidiasis were from seven African countries (Fakhim et al., 2020). Few researchers have studied vulvovaginal candidiasis in Ekiti State, but they have not explored the prevalence of candidiasis infection in the same state.

Methods

This study used a retrospective descriptive design. Simple random sampling technique was adopted to select one thousand five hundred and fifty (1550) patients who attended the Federal Teaching Hospital, Ido-Ekiti, Ekiti Stste, Nigeria, from January to December 2020. Medical records of suspected and confirmed patients for candidiasis were collected from the health information management unit of the Federal Teaching Hospital, Ido-Ekiti. Data collected was analysed by imploring the use of the SPSS 19.0 software for Windows (SPSS, Inc., Chicago, IL, USA). Results were represented in percentages, frequencies, and charts. Statistical significance was set at $P<0.05$.

Results

A total of 1550 patients tested positive, resulting in an overall prevalence of 3.55%. This is illustrated in Table 1. A total of 605 (39.03%) of the patients were

male, while 945 (60.97%) were female. This is illustrated in Table 2. Eighteen (2.96%) of the 605 male subjects were positive, while thirty-seven (3.92%) of the 945 female subjects were positive. Table 3 and Graph 1 illustrate this. The candidiasis infection did not affect the age group 41-50 (1.42%). None of the subjects in the age range of 1–20 years tested positive. The table below illustrates this.

Table 1: Test Results for Candidiasis Infection

	HVS	URINE	WOUND	SPUTUM	TOTAL	PERCENT
POSITIVE	21	5	22	18	55	3.55
NEGETIVE	584	220	480	240	1524	

The Table 1 above represented test result of candidiasis infections from different samples. 3.55 % was identified positive.

TABLE 2: Gender Distribution of respondents

	No of Patients	Percent (%)
MALE	605	39.03
FEMALE	945	60.97

Table 2 revealed that 39.03% were man and 60 .97% were female

TABLE 3: Incidence of Candidiasis infection among sex

SEX	High Vagina Swabs	Urine	Wound	Sputum	TOTAL
Male	O	O	6	12	18
Female	21	5	5	6	37

The Table 3 above represented incidence of Candidiasis infection among Sex. Female were more infected than male.

TABLE 4: Distribution of Candidiasis Infections among Age Groups

AGE	HVS	URINE	WOUND	SPUTUM	TOTAL	PERCENT
1-10 Years	Nil	Nil	Nil	Nil	Nil	0.0
11-20Years	Nil	Nil	Nil	Nil	Nil	0.0
21-30 Years	1	Nil	Nil	2	3	5.5
31-40 years	6	1	3	6	16	29.0
41-50Years	9	2	2	9	22	40.0
51-60 years	5	2	6	1	14	25.5
Total					55	100

The above Table 4 represented distribution of Candidiasis infections among age groups. Age group of 41-50 years had the highest infection while age groups 1-20 were not infected from candidiasis.

Discussion

The study was done in Federal Teaching Hospital, Ido-Ekiti. The Federal Teaching Hospital Ido-Ekiti received patients from rural areas or those referred from general hospitals and primary health centers. In this study, a prevalence of 3.55% of candidiasis in the patients attending Federal Teaching Hospital, Ido-Ekiti, was reported. Females had a prevalence of 3.92%, while males were 2.95%. Vulvovaginal candidiasis is the primary

cause of candidiasis in females (Mbakwem-Aniebo et al., 2020). The prevalence of vaginal candidiasis reported by different studies was 16.5%, 21.31%, 19%, and 14% (Emeribe et al., 2015; Michael, et al., 2022). According to Okwelle and Bara-Hart (2022), adequate knowledge, excellent personal hygiene, and normal levels of oestrogens and corticoids may contribute to the low prevalence of this result compared to other studies. Thrush, which occurs in males, is known as balanitis (Daniel, 2018). The prevalence of candidiasis in males is similar to previous studies, which stated that it is fairly common and affects approximately 3-11% of males during their lifetime (Anton, et al., 2022). However, the study by Lisboa et al. (2010) reported a prevalence of candida balanitis of 18%. The prevalence of Candida species infection was higher in females than in males. This may be due to high sexual activity, poor personal hygiene, and the use of contraceptives among females.

Candida species were observed mostly among the age-group 41-50 years (22 [40%]), followed by 31-40 years {16 (29%)} and least among those less than 20 years. The high prevalence seen in people aged 41 to 50 is similar to what was found in a previous study, which found that the growth was stronger in the female group than in the male group, showing microbiologically as intermediate, intense, and abundant yeast growths. The youngest group of patients, those under 50 years old, frequently experienced these growths (Jolanta et al., 2016). The finding of this study is different from the previous study by Micheal, et al., who stated that candida-positive cultures were observed mostly among those aged 20–30 years, at 36 (45.0%) and lowest among those less than 20 years, at 2 (1%).

Conclusion

The prevalence of candida infection was low compared to other states in Nigeria. The findings also revealed the highest prevalence of candida infection among patients aged 41–50 years.

Recommendations

1. The prevalence of candida infection is higher in females than males. Therefore, this study recommends that medical practitioners, through various channels such as conferences, workshops, and seminars, should prioritize laboratory diagnosis of candida infection to identify the fungal isolate before initiating treatment.
2. Furthermore, health educators should raise awareness about routine screening procedures; both men and women of reproductive age should strive for perfection.

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