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Research Article

Prevalence of Candida and Monilia Fungal Infection in Al-Najaf Governorate

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Abstract

This study aimed to conduct a survey and statistical analysis in Najaf Governorate to determine the prevalence of infections caused by the fungal genera Candida and Monilia. The infection rates varied among hospitals. A total of 1,211 samples were recorded during 2025 from Hospitals in Al-Najaf. The results showed a variation in infection rates between the two genera, with the prevalence of Candida reaching 8.01%, while the prevalence of Monilia was 4.05%. The results also indicated that fungal infections were slightly higher among females 50.7% (74/146) compared to males 49.3% (72/146). Furthermore, the study examined the variation in infection rates across the months of the year. The highest frequency was recorded in November (17 cases, 11.64%), while the lowest was observed in January (9 cases, 6.16%).

1. Introduction

The study of fungi is known as Mycology, while diseases caused by fungi are referred to as Mycoses, there is only a limited number of fungal species are pathogenic to humans, the study of fungi is known as Mycology, while diseases caused by fungi are referred to as Mycoses [1, 2]. Fungi may exist either as unicellular or multicellular organisms (filamentous forms) and fungi reproduce either sexually or asexually to produce sexual or asexual spores, enabling them to complete their life cycle [3, 4].

Fungi play an important role in causing diseases in humans and animals, which may eventually lead to opportunistic systemic infections and chronic allergic conditions such as Asthma, Hay Fever, and Pulmonary Hypersensitivity [2, 5]. Fungi possess several virulence factors that enable them to cause disease in humans, including their ability to grow at body temperature (37 °C) and to produce very small fungal spores (less than 2 µm), which facilitates their entry and adhesion to epithelial cells of host tissues. In addition, fungi can produce substances such as toxins and enzymes that help them overcome the host immune defense mechanisms [6].

Candida albicans is present in the gastrointestinal tract system, with a prevalence of approximately 50%, in healthy individuals present in the female genital tract, and rectum, at 10–20% (Cho and Lorenz et al., 2020). The Candida genus is one of the most common yeasts causing nosocomial infections, which are acquired from internal sources. It is isolated from areas in contact with mucous membranes, particularly the small intestine, reproductive organs, and urinary tract [7]. Candida spp. cause a variety of chronic diseases, including superficial skin or mucous membrane infections, conjunctivitis (eye inflammation), mydriasis (pupil constriction), pneumonia, and endocarditis [8]. Monilia is a yeast-like fungus that commonly inhabits moist body surfaces and may act as an opportunistic pathogen. Several factors, including antibiotic use, diabetes mellitus, poor hygiene, and immunosuppression, can promote its growth and infection [9].

Due to the importance of medical fungi, their wide distribution, and their close association with humans, considerable attention has been given to studying their prevalence and impact on human health.

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2. Methods

The current study were conducted in Al-Najaf Governorate to investigate infections caused by the yeast fungi Candida and Monilia among both males and females. A total of 1,211 samples were recorded during the period 2025 suspected to have fungal infection from several hospitals, including Al Sadr Teaching Hospital, Al Hakeem General Hospital, Al Haideriya Hospital, and Al Manathera Hospital. The SPSS system was used for statistics analysis.

3. Results and Discussion

3.1. Distribution of Samples Collected from Hospitals in Najaf Governorate

The Figure 1 illustrates the distribution of samples across different locations. Al-Manathera recorded the highest frequency with 756 samples (62.42%), followed by Al-Haideriya with 300 (24.77%) samples. Al-Sadr Teaching and Al-Hakeem recorded 80 (6.61%) and 75 samples (6.20%), respectively.

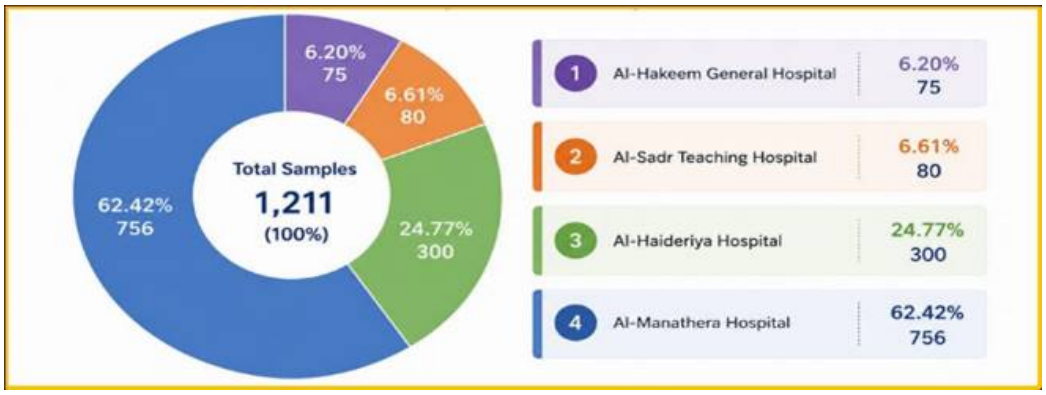

Figure 1: Distribution of Samples Collected from Hospitals in Najaf Governorate

The higher rates of sample suspected to have fungal infection were at *Al-Manathera* and *Al-Haideriya* hospitals compared to *Al-Hakeem* and *Al-Sadr* may be attributed to differences in patients' social status and lower public health awareness [10]. Similar observations have been reported in Iraq, where fungal infections were found to vary according to environmental and socioeconomic factors [11].

3.2. Candida & Monilia Fungal Infection Rates

A total of 1,211 samples were collected from all hospitals in Najaf Governorate. The study results showed that the overall prevalence of fungal infections caused by *Candida* was 8.01% (97/1211), while that of *Monilia* was 4.05% (49/1211), resulting in a total fungal infection rate of 12.06% (146/1211), Figure 2.

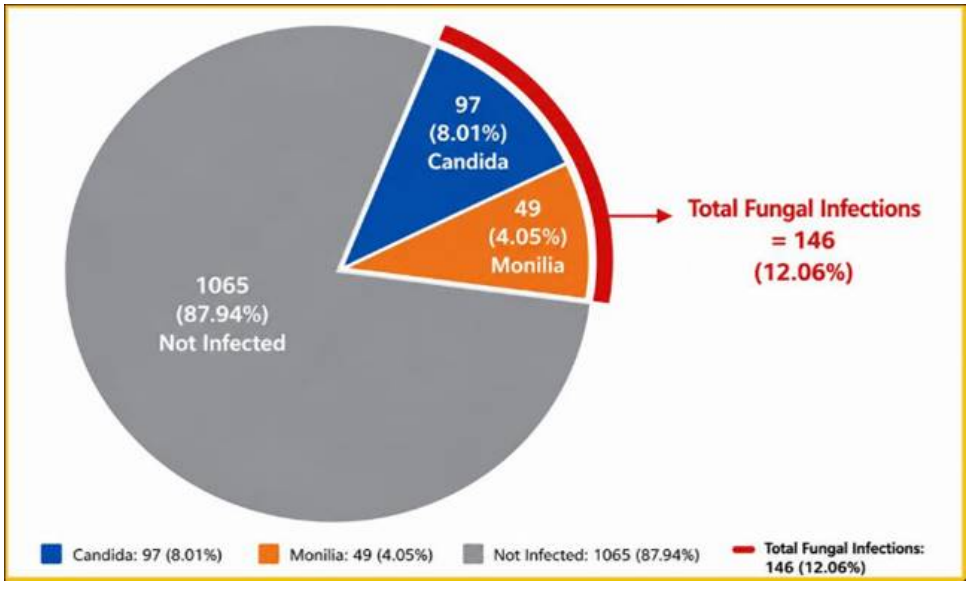

Figure 2: Overall Prevalence of Candida and Monilia fungal Infections Among Samples Collected from Hospitals in Najaf Governorate during 2025

These findings are consistent with previous studies: Chadegani et al. (1987), Bahmadan et al. (2009), and Jamil et al. (2002) reported fungal infection rates of 10.8% in Isfahan, Iran; 6.2% in the Asir region, Saudi Arabia; and 17% in Baghdad, Iraq, respectively. Carito et al.

(2018) found that the prevalence rate in Italy was 74%, while the prevalence rate in Tripoli, Libya was 53.1% (Labeeb and Khalifa, 2016). These discrepancies could be due to population size, seasonality or socioeconomic status of the population studied.

3.3. Distribution of Candida and Monilia Infections According to Gender

This study focused on the yeast fungi Candida and Monilia to be analyzed statistically. Males had an infection rate of 49.3% (72/146) while females had 50.7% (74/146). Candida and Monilia infection rate in males were 32.9% (48/146) and 16.4% (24/146); and females 33.6% (49/146) and 17.1% (25/146) respectively, regarding specific fungal genera, Figure 3.

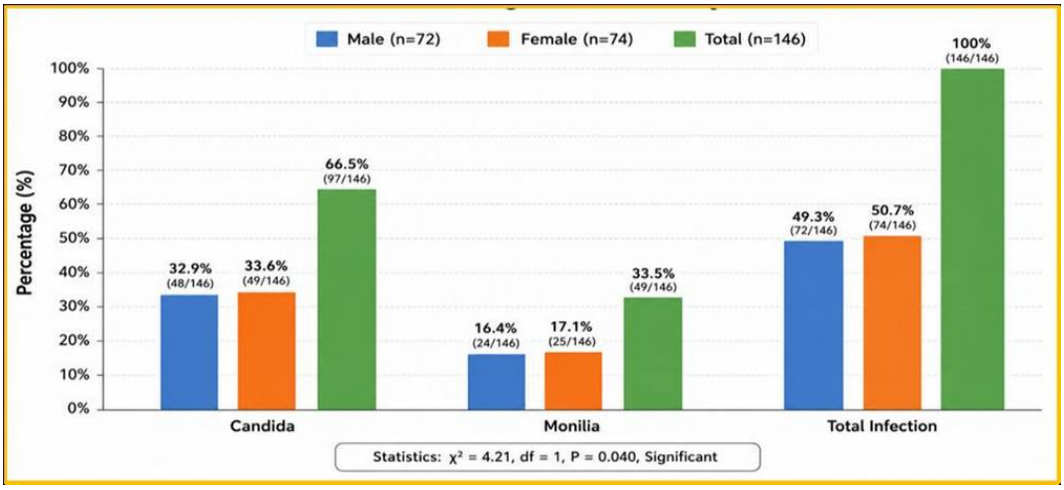

Figure 3: Distribution of Candida and Monilia Infections According to Gender Among Infected Cases

In both situations, the female infection rate was higher than that of males. This finding may be attributed to factors favor fungal colonization and growth as hormonal factors, pregnancy, antibiotic use, diabetes mellitus, and the vaginal microenvironment, which favor fungal colonization and growth [12].

The overall infection rate in all hospitals was 66.5% (97/146) and 33.5% (49/146) for Candida and Monilia respectively. A part of this may be because of diagnostic confusion, since in many hospitals and diagnostic laboratories, some lab personnel misdiagnose Monilia as Candida [13]. Furthermore Candida species are more tolerant of unfavourable conditions than Monilia species because they have three different morphological forms, each with a different optimum pH and temperature range, the yeast form has an optimum temperature of 30°C and pH of 4, the pseudohyphal form an optimum of 35°C and pH of 6 and the hyphal an optimum of 37°C and pH of 7. The wide range enables Candida to infect different areas of the body [10].

3.4. Monthly Variation in Infection Rates

Figure 4 shows that fungal infections varied throughout 2025. The highest frequency was recorded in November (17 cases, 11.64%), while the lowest was observed in January (9 cases, 6.16%). The remaining months showed moderate variation, with infection rates ranging from 6.85% to 9.59%.

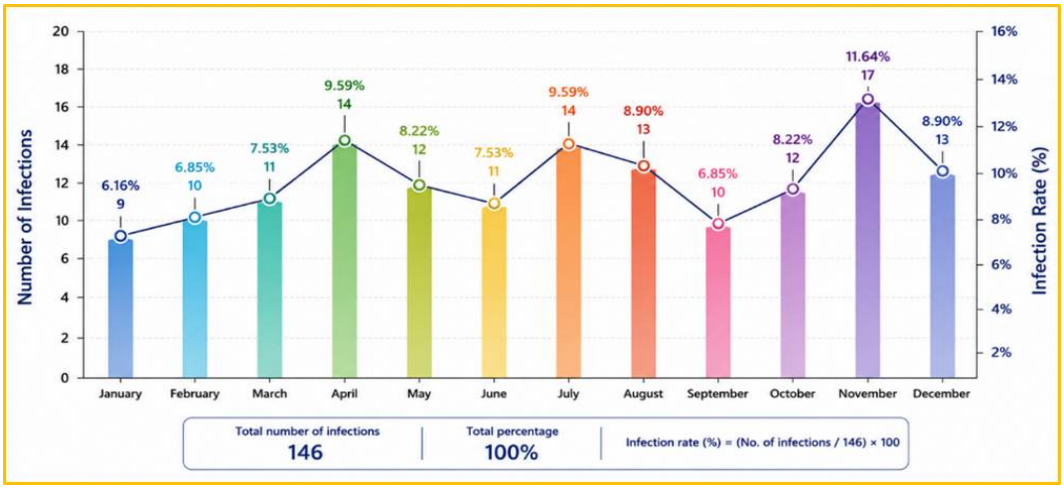

Figure 4: Monthly Distribution of Candida and Monilia Infections During 2025

The increased infection rates in November and April can be attributed to optimal environmental temperatures for fungal growth (25–32°C). In contrast, the lower rates in July are due to higher temperatures exceeding this optimal range, while extremely high or low temperatures throughout the year limit fungal prevalence [10]. Similar findings were reported by Nageen [14], who demonstrated that environmental

factors, particularly temperature and relative humidity, play an important role in the diversity and concentration of fungal communities throughout different seasons.

4. Conclusions

Monilia, Candida and total fungal infection rate in the Al-Najaf Governorate were 4.05% and 8.01% and 12.06% respectively, However, total fungal infection rate was higher in November and lower in January.

Article Information

Disclaimer (Artificial Intelligence): The author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.), and text-to-image generators have been used during writing or editing of manuscripts.

Competing Interests: Authors have declared that no competing interests exist.

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