IDENTIFICATION OF Candida sp IN DIABETES MELLITUS URINE IN PROF. DR. H. ALOEI SABOE, GORONTALO CITY

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ABSTRACT

This study aims to identify Candida sp in the urine of patients with diabetes mellitus at the Prof. Regional General Hospital. Dr. H Aloe Saboe, Gorntalo City.

This type of research is qualitative using descriptive methods and data collection techniques, namely fungal culture examination, interviews and documentation. The sampling technique used in this study was purposive sampling, with a total of 10 people.

Based on the results of the study, it was found that Candida albicans, Candida glabrata, Candida parasilopsis, Candida dubliniensis were found in culture media, Candida species were round, smooth, white-cream colored with shiny colonies, and the fungus Aspergilus fumigatus.

Keywords: *Candida sp*, Urine, Diabetes Mellitus

INTRODUCTION

Diabetes mellitus is a chronic disorder with signs of blood glucose levels that exceed normal values, which can cause hyperglycemia, namely increased levels of sugar in the blood, urine and excessive ketone compounds [11].

According to the American Diabetes Association (ADA) (2011), Diabetes mellitus includes a group of metabolic disorders in general symptoms of hyperglycemia. The existence of various types of diabetes, including the cause of the complex interaction of genetic factors and environmental factors. Various pathological stages include the development of diabetes, starting with the destruction of cells in the pancreas as well as the consequences of insulin deficiency, to abnormalities that lead to insulin resistance [5].

Diabetes mellitus is characterized by symptoms of increased blood sugar levels caused by the body no longer having the hormone insulin or insulin not being able to work properly.

Based on the American Diabetes Association (ADA) [1], the classification of one type of diabetes on a person always depends on the conditions when making the diagnosis, the number of diabetic patients who are difficult to classify in one of these types. Thus, in determining effective treatment, understanding the pathogenesis through hyperglycemia is very important compared to classifying certain types of DM.

In accordance with this explanation, it can be concluded that when the concentration of glucose in the blood is high enough, the kidneys cannot absorb all of the glucose that is filtered out, so that certain glucose arises in the urine (glucosuria). Excess glucose is excreted in the urine, this excretion can coincide with the loss of excess fluid and electrolytes.

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The loss of excess fluid causes the patient to experience an increase in urination (polyuria) and feel thirsty (polydipsia).

The prevalence of diabetes mellitus is difficult to determine because the standard for determining the diagnosis is different. According to data from the International Diabetes Federation (IDF), Indonesia has a diabetes mellitus alert status because it ranks 7th in 10 countries where the number of people with diabetes is the largest. The prevalence of people with diabetes in Indonesia is up to 6.2 percent, meaning that there are more than 10.8 million people experiencing diabetes per year 2020, this number is estimated to increase to 16.7 million people per year 2045 [15].

In accordance with data from the Gorontalo Provincial Health Office, the prevalence of diabetes mellitus cases in Gorontalo Province has increased in the last 3 years, where in 2017 it was 3.5%, in 2018 it was 5.1% and in 2019 it was 7.4%. In addition, according to data in 2019, the prevalence of DM patients in Gorontalo City occupies the second level after Gorontalo Regency in all regencies/cities in Gorontalo Province, which is 2,881 cases (5.6%) [8].

In accordance with the data obtained at the Regional General Hospital Prof. Dr. H. Aloei Saboe, Gorontalo City, from January to August 2020, there were around 292 people with diabetes mellitus. Then from January to March 2021, there were 88 patients with diabetes mellitus.
In accordance with Gorontalo City Health Service data in 2019, the South City Health Center occupies the 3rd level after the Dungingi Health Center and the Dumbo Raya Health Center where the prevalence of DM is 640 cases (16.2%). The South City Health Center shows the prevalence of DM cases. In the last 3 years there has been a significant increase, namely 2017, in 2018 with 2019, each of which was 135 cases (6.5%), 468 cases (7.8%) with 765 cases (19.4%) [3].

In people with diabetes mellitus, infection is very large, because the body's natural defense mechanism against people with diabetes mellitus is lowest, complications related to diabetes can increase the risk of infection, the amount of glucose levels in the blood, tissues, and urine. For women who experience DM have sugar extract on the vaginal wall [17].

For women who have DM have sugar extract on the vaginal wall. The sugar in the urine accumulates in the vulva until it becomes food for the fungus to live. The female genital area is a fertile and ideal place for fungal life so that Candida sp can be found in the urine of women who have DM.

*Candidiasis*is an acute and subacute infection caused by the presence of Candida sp. or sometimes other Candida species, which can attack various body tissues [11]. But in excess of life in the organism can cause symptoms. Symptoms of Candidiasis vary depending on the area of the body that is infected. Candidiasis that develops in the mouth and throat is called "thrush" and Oropharyngeal candidiasis. Vaginal candidiasis is always referred to as a “yeast infection”. Invasive candidiasis is formed when Candida species penetrate the bloodstream and spread throughout the body [14].

The fungus Candia sp can play a role in pathogenic microorganisms which give rise to primary and secondary infections. Patients with DM can get certain fungal infections because the body's natural defense mechanism is the lowest. Associated with diabetes mellitus can increase the risk of infection, increase blood sugar levels, tissues and urine. Several predisposing factors can change the nature of the Candida sp fungus to become pathogenic, including: diabetes

mellitus, antibiotic abuse, drug use, and pregnancy.

Fungi are a result of infection mainly in tropical and subtropical countries, such as in Indonesia. One that can be caused by fungi is called mycosis. Mycoses that have a very high incidence are dermatophytosis with candidiasis [15].

Candidais a mushroom that has more than 20 kinds. But the type of Candida that very often causes infection is Candida sp. Candiadisis can occur in various parts of the human body, but the part that is most often affected by this infection is the mouth and around the intimate organs. Other body parts that can be affected by Candida infection are the nails, the esophagus, the area around the anus, as well as the digestive tract.

Candida sp is a group of normal flora in the skin, mucous membranes, and digestive tract. Infection caused by Candida sp is called candidiasis. Candidiasis is divided into superficial candidiasis and deep candidiasis. Superficial candidiasis (cutaneous or mucosal) is a Candida infection that is formed from the increasing number of local candida and damage to the skin and epithelium which may be local invasion of yeast or pseudohyphae in the skin, hair, nails with mucous membranes. However, deep candidiasis is a Candida infection of the internal organs as well as the bloodstream, formed when candida enters the bloodstream with inadequate body resistance to contain life and the spread of yeast so that it can cause infection in several organs [19].

Candidiasis is a fungal infection caused by Candida sp. Which includes a fungal infection that is always found to attack humans. Candidiasis is formed because there is an excess of fungal life which normally occurs in small numbers [26].

These mycoses caused by the fungus Candida show the widest spectrum of clinical presentations and can be classified from superficial, as in skin and mucosal infections, to deep, widespread and elevated, as is the case with invasive candidiasis. The main transmission mechanism is through endogenous candidaemia, where Candida species which are microbiota from various anatomical sites in weak host conditions are opportunistic pathogens. Another mechanism for transmission is exogenous, and it occurs primarily through the hands of a healthcare professional caring for a patient[19].

Spread of infection can also occur through healthcare materials, such as catheters and contaminated intravenous solutions. Candida sp is considered an important pathogen because of its flexibility and ability to survive in various anatomic sites [26].

Some species through the genus Candida can cause candidiasis. They are a group of normal flora in the skin, mucous membranes, with the gastrointestinal tract. Candida species occupy human mucosal surfaces immediately after birth, with the risk of endogenous infection remaining. Candidiasis is a very common systemic mycosis, with the most common agents being C. albicans, C. parapsilosis, C. glabrata, C. tropicalis, C. guilliermondii, and C. dubliniensis [10].

1. *Candida albicans*

Candida albicans is a fungus whose natural habitat is always present in the human body. Candida fungi are often found in the digestive tract, mouth, vagina, rectum (anal canal), and other body parts with warm temperatures.Candida albicans is not harmful. The presence of these fungi can often be controlled appropriately if the human body has the best immune system. However, the fungus can only cause problems and cause infection if the population reproduces uncontrollably.

2. *Candida Parapsillosis*

*Candida parapsilosis*is a major emerging human pathogen that has increased dramatically, so Candida parapsilosis is now one of the leading causes of invasive candidal disease. Individuals at highest risk for severe infection include neonates and patients in intensive care units. Candida parapsilosis infection is mainly associated with hyperalimentation solutions, prosthetic devices, and catheters, as well as the spread of nosocomial disease through the hands of health workers.

*Candida parapsilosis*is a fungal species of yeast that has been a significant cause of sepsis and wound and tissue infection in people with compromised immune systems. Candida parapsilosis is also an opportunistic pathogen in humans that can cause cutaneous infections, especially of the nails and systemic diseases such as endocarditis.

Factors involved in disease pathogenesis include secretion of hydrolytic enzymes, adhesion of prosthetics, and biofilm formation. New molecular genetic tools provide additional and much needed information on virulence*Candida Parapsilosis*. Emerging information will provide a deeper understanding of the pathogenesis*Candida Parapsilosis* and facilitate the development of new therapeutic approaches to treat infections *Candida Parapsilosis.*

3. *Candida glabrata*

Candida glabrata, formerly known as Torulopsis glabrata, contrasts with other Candida species in its nondimorphic blastoconidial morphology and haploid genome. Candida glabrata currently ranks second or third as the causative agent of superficial (oral, esophageal, vaginal, or urinary tract) Candida infections, which are often nosocomial. However, there are currently few known virulence factors for Candida glabrata and little is known about the defense mechanisms that protect against infection.

*Candida glabrata*is a haploid yeast species of the genus Candida formerly known as Torulopsis glabrata. Namely that no sexual life cycle has been documented for this species.

Until recently, Candida glabrata was considered a relatively nonpathogenic commensal fungal organism of human mucosal tissue. However, with the increasing use of immunosuppressive agents, mucosal and systemic infections caused by Candida glabrata have increased significantly, especially in populations infected with human immunodeficiency virus.

4. *Candida tropicalis*

*Candida tropicalis*which is one of the most important Candida species, and considered the second deadliest Candida species, preceded only by Candida albicans. In addition, this species has been recognized as a highly potent biofilm producer, surpassing Candida albicans in most studies. In addition, it produces a variety of other virulence factors, including: buccal epithelial and endothelial cell adhesion; secretion of lytic enzymes, such as proteinases, phospholipases, and hemolysins, bud-to-hyphal transition (also called morphogenesis) and a phenomenon called phenotypic switching.

*Candida tropicalis*is a species of yeast in the genus Candida. It is a common pathogen in neutropenic hosts, where it can spread through the bloodstream to peripheral organs. Candida tropicalis is also a sNCAC species that occupies the third and fourth levels, which is very important

in blood cultures of dentofacial patients.

*Candida tropicalis*also a species that is very closely related to Candida albicans and has been easily identified by phenotypic and molecular methods. Moreover, no cryptic sibling species have been described in the literature, as opposed to several medically important *Candida* species

5. *Candida guilliermondii*

*Candida guilliermondii*which has been recovered from this patient and stored (as an aqueous suspension). Cases were analyzed to determine whether the patient had CVC when fungemia was diagnosed and whether or not it had been removed. In cases where the CVC was removed, semiquantitative culture results from the catheter tip and the patient's response in terms of fever curve.

Candida guilliermondii is a species of yeast of the genus meyerozyma whose asexual or anamorphic form known as Candida guilliemondii has been isolated from various human infections, mostly from culottes, if only from immunosuppressed patients.

6. *Candida dubliniensis*

*Candida dubliniensis*is a recently described species of chlamydospore and germ-tube positive yeast that has been recovered mainly from the oral cavity of human immunodeficiency virus (HIV)-infected individuals with AIDS patients. These organisms have been recovered from patients in a wide geographic location, and their phenotypic and genotypic characteristics have been described in detail. Currently, the best available data on the incidence of Candida dubliniensis comes from studies of Irish subjects. In that study, Candida dubliniensis was found from the oral cavity of 27% of HIV-infected persons and 32% of AIDS patients with clinical symptoms of oral candidiasis and of 19% of HIV-infected persons and 25% of AIDS patients without clinical symptoms of oral candidiasis.

*Candida dubliniensis*is a fungal opportunistic pathogen originally isolated from AIDS patients. It is also sometimes isolated from immunocompetent individuals. It is also a dimorphic yeast of the genus Candida, very closely related to Candida albicans but forming distinct phylogenetic clusters in DNA fingerprints.

Based on several theories about candidiasis above, according to the author, candidiasis can be formed because there is an overgrowth of fungus when normally it should be in small amounts. The candidiasis can be exacerbated by decreased host immunity.

Candida sp are yeast cells that are thin-boned, gram-positive, do not have a capsule, form oval to spherical in size 3-4 m. Candida sp is also in the form of pseudohyphae if the shoots are always alive, but fail to break away until they get long cell chains with notches or narrows in the insulating area of the cell. Candida sp is dimorphic, besides yeast with pseudohyphae Candida sp can also get true hyphae [9]. Candida sp reproduces in a self-reproducing manner using spores that live through shoots called blastospores [19].

Candida organisms live rapidly on blood culture bottles and on agar plates. In culture media, Candida species are smooth, creamy white in color, in shimmering colonies. The number of *Candida* species was quickly identified according to the criteria of life as well as commercial kits evaluating the assimilation of carbohydrates by fermentation reactions also resulted in the identification of species through Candida isolates up to 2-4 days [4].

In the description above, the researchers wanted to identify a Candida sp in the urine of DM patients in the Gorontalo province, for that the researchers took the title of the study: "Identification of Candida sp in the urine of DM patients at the Prof. Regional General Hospital. Dr. H. Aloei Saboe Gorontalo City,".

RESEARCH METHODS

The type of research used is descriptive. Descriptive research aims to describe and describe one of the symptoms, events and events experienced [12]. In these observations, researchers will describe Candida sp in the urine of people with diabetes mellitus.

The types and sources of data used in these observations are primary data and secondary data. Primary data on these observations are the results of Candida sp laboratory examinations, documentation, interview resultsin patients with diabetes mellitus at the Regional General Hospital Prof. Dr. H. Aloei Saboe Gorontalo City.

The data obtained descriptively are then presented in the form of a table accompanied by a narration.

RESEARCH RESULT

In accordance with the results of observations carried out at the Microbiology laboratory of Bina Mandiri University, Gorontalo, in 10 urine samples of patients with diabetes mellitus, 5 pure isolates were obtained. For more details can be reviewed in the following description:

1. Mushroom Isolation 1

Isolation of fungus 1 obtained Code U. Pure isolation obtained, identified and observed by means of macroscopic and microscopic. Through macroscopic testing on isolates of 3 molds, it was found that they had the following characteristics:

Table 1. Results of Observation of Isolates

No	Observed Features	Observation result
1.	Colony color	White
2.	Base color in medium	White
3.	Colonial Nature	Smooth Round

Source: Primary Data, 2021

For a very clear macroscopic examination with a microscope in isolation can be reviewed in the following figure:

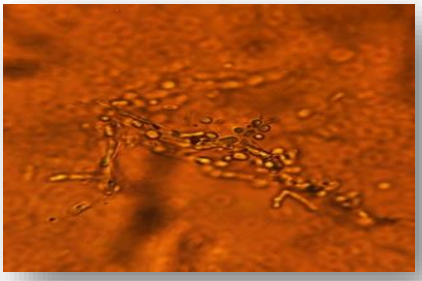

Figure 1 Mushroom Isolation 1
Source: Secondary Data, 2021

Mushroom isolate 1 top view; microscopic observation data of fungal isolate 1 in 400 X magnification.

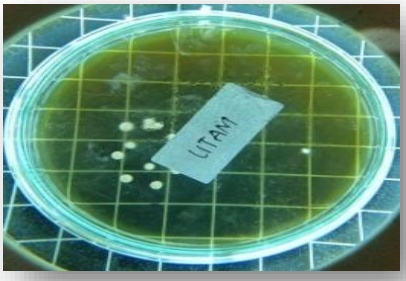

Figure 2 Mushroom Isolation 1
Source: Secondary Data, 2021

Table 2. Observation Results of Isolate 1

No	Observed characteristics	Observation result
1.	Blastospores: a. Shape : b. Color :	 Round,Oval Transparent

Source: Primary Data, 2021

In accordance with the characteristics obtained by microscopic observations, so that the fungal isolate 1 has the characteristics of a shoot that can always be elongated in the form of pseudo hyphae. Pseudo hyphae are rounded or oval in shape around the septum, in various strains the blastospores are large in size, forming spheres such as bottles, which are few in number [25].

From the characteristics of the microscopic examination, the fungal isolates code 1 can be classified as follows:

Kingdom : Fungi
Phylum : Ascomycota
Subphylum : Saccharomycotina
Class : Saccharomycetes
Family : Saccharomycetaceae
Genus : Candida
Species : Candida albicans [25].

2. Fungus Isolation 2

Fungal isolation 2 was obtained from patient code U1. Pure isolates were obtained, identified and observed by means of macroscopic and microscopic methods. Through macroscopic testing on fungal isolates 2, the characteristics in the table were obtained.

Table 3. Isolate 2 Observation Results

No	Observed features	Observation result
1	Choline color	White
2	Base color on medium	White
3.	Colony nature	Smooth round

Source: Primary Data, 2021

So that it is clearer that macroscopic and microscopic testing in isolation can be seen in the following figure:

Figure 3 Fungus isolate 2
(Source: Secondary Data, 2021)

Mushroom isolate 2 top view; microscopic observation data of fungal isolate 2 in 400 X magnification.

Table 4. Observations of isolates Mushroom 2

No	Observed characteristics	Observation result
1.	Blastospores: a. Shape : b. Color :	 Round Transparent

Source: Primary Data, 2021

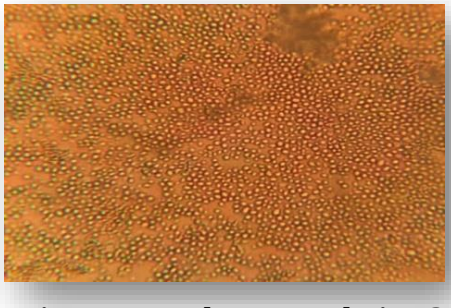

Figure 4 Mushroom Isolation 2
(Source: Secondary Data, 2021)

In accordance with the characteristics obtained in the macroscopic examination as well as microscopic, so that fungal isolates 2 had characteristics which were round, oval, and oval. The blastospore is spherical. The surface of the colony is round, smooth, slightly convex, slightly alkaline, shiny round, and white in color [25].

From the characteristics of the microscopic examination, the fungal isolates code 1 can be classified as follows:

Kingdom : Fungi
Phylum: Ascomycota
Subphylum: Saccharomycotina
Class : Saccharomycetes
Family : Saccharomycetaceae
Genus: Candida
Species: Candida albicans [25].

3. Fungus Isolation 3

Fungal isolation 3 was obtained from patient code U2. Pure isolates were obtained, identified and observed by means of macroscopic and microscopic methods. Through macroscopic testing of fungal isolate 3, the characteristics in the table are as follows:

Table 5. Results of Observation of Isolate 3

No	Observed features	Observation result
1.	Choline color	White
2.	Base color on medium	White
3.	Colony nature	Smooth round

Source: Primary Data, 2021

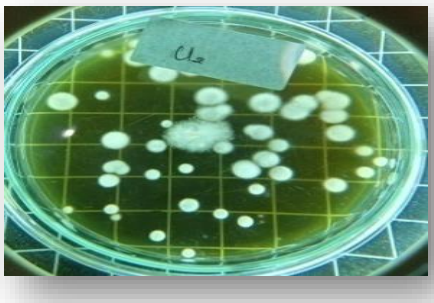

Figure 5 Mushroom Isolation 3
(Source: Secondary Data, 2021)

Mushroom isolate 3 top view; microscopic observation data of fungal isolate 3 in 400 X magnification.

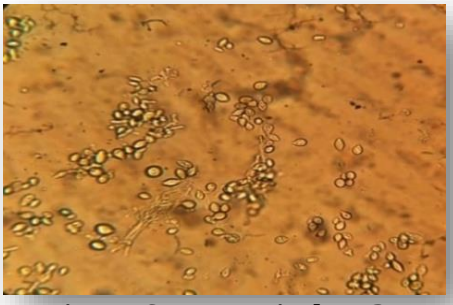

Figure 6 Fungus isolate 3
Source: Secondary Data, 2021

Table 6. Observations of 3 isolates

No	Observed characteristics	Observation result
1.	Blastospores: a. Shape : b. Color :	 Round, Oval White

Source: Primary Data, 2021

In accordance with the characteristics obtained in the microscopic examination, so that the fungal isolate 3 had the characteristics of round, oval, and oval. Blastospores are round, oval in shape. The surface of the colony is round, smooth, slightly convex, slightly alkaline, shiny round, and white in color [25].

From the characteristics of the microscopic examination, the fungal isolates coded U2 can be classified as follows:
Kingdom : Fungi
Phylum: Ascomycota
Subphylum: Saccharomycotina
Class : Saccharomycetes
Family : Saccharomycetaceae
Genus: Candida
Species: Candida albicans [25] .

4. Mushroom Insulation 4

Fungal isolation 4 was obtained from patient code H. Pure isolates were obtained, identified and observed by means of macroscopic and microscopic methods. Through macroscopic testing of fungal isolate 4, the characteristics in the table are obtained as follows:

Table 7. Results of Observation of Isolate 4

No	Observed features	Observation result
1.	Choline color	Yellow
2.	Base color in medium	Yellow
3.	Colony nature	Smooth round

Source: Primary Data, 2021

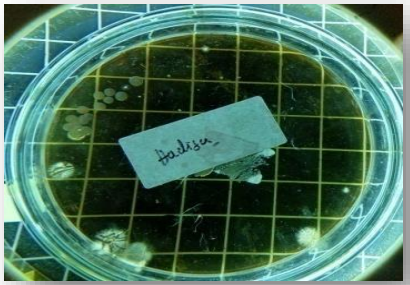

Figure 7 Isloat mushroom 4
(Source: Secondary Data, 2021)

Mushroom isolate 4 top view; microscopic observation data of fungal isolate 4 in 400 X magnification.

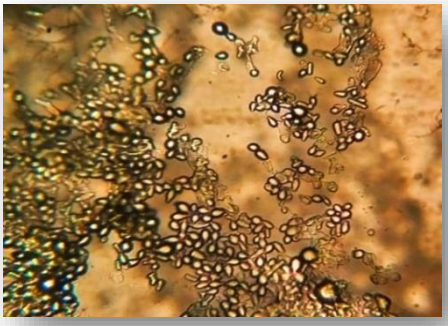

Figure 8 Mushroom Isolation 4
(Source: Secondary Data, 2021)

Table 8. Observation Results of Isolate 4

No	Observed characteristics	Observation result
1.	Blastospores: a. Shape : b. Color :	 Round, oval White

Source: Primary Data, 2021

In accordance with the characteristics obtained in the microscopic examination, so that the fungal isolate 3 had the characteristics of round, oval, and oval. Blastospores are round, oval in shape. The surface of the colony is round, smooth, slightly convex, slightly alkaline, shiny round, and white in color [12].

From the characteristics of the microscopic examination so that the isolates of the fungus code Hadija can be classified as follows:
Kingdom : Fungi
Division : Ascomycota
Subphylum: Saccharomycotina
Class : Saccharomycetes
Family : Debaryomycetaceae
Genus: Candida
Species: Candida dubliniensis [25].

5. Mushroom Isolate 5

Fungal isolates were obtained from patients code I2. The pure isolates obtained were identified and tested by macroscopic and microscopic methods. Through macroscopic testing in isolates:

Table 9. Results of Observing Isolate 5

No	Observed features	Observation result
1.	Choline color	Yellow
2.	Base color in medium	Yellow
3.	Colony nature	Rough

Source: Primary Data, 2021

Figure 9 Mushroom Isolation 5
(Source: Secondary Data, 2021)

Mushroom isolate 5 top view; microscopic observation data of fungal isolate 5 in 400 X . magnification

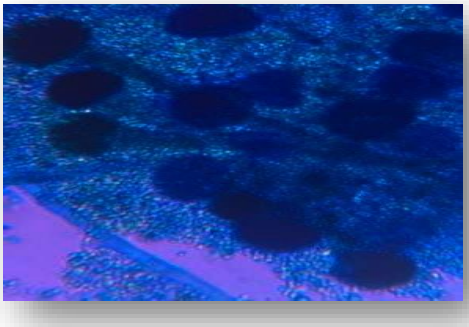

Figure 10 Mushroom Isolation 5
Source: Secondary Data, 2021

Table 10. Observation Results of Isolate 5

No	Observed characteristics	Observation result
1.	hyphae: a. agree / not	 No Parting
2.	Conidiophores: a. Color b. Branched / not c. Smooth Walls / no	 Yellow branch Fine
3.	Vesicles: a. Shape b. Is there any or not c. Color	 Round There is Blue

	Fialide:	
.	a. Grow On	Metulla
	b. Color	Blue
	Conidia:	
.	a. Color	Kining
	b. Shape	Round
	c. Wall	Rough

Source: Primary Data, 2021

In accordance with the characteristics obtained in microscopic testing, so that the fungal isolate 5 had characteristics where the colony was yellow. The hyphae are not septate, the conidiphores are colorless, smooth and branched. Fialides grow on the metula are spherical in shape, with transparent conidia that are roughly round in shape [13].

From the characteristics of the microscopic examination so that the fungal isolates code I2 can be classified where:

Kingdom : Fungi
Division : Ascomycota
Subphylum : Saccharomycotina
Class : Eurotimycetidae
Family : Aspergillaceae
Genus : Aspergillus
Species : Aspergiluus fumugatus [13].

DISCUSSION

Based on observational data carried out at the Microbiology laboratory at Bina Mandiri University, Gorontalo, from 10 urine samples from diabetes mellitus patients, 5 pure isolates were obtained, of which 4 were candida sp, namely candida albicans, candida glabrata, candida parasilopsis, candida dubliensis and 1 isolate including the fungus Aspergillus fumigatus.

Candida sp are yeast cells that are thin, gram-positive, do not have a capsule, form oval to spheres measuring 3-4 m. Candida. Candida sp is dimorphic, besides yeast with pseudohyphae Candida sp can also produce hyphae [9]. Candida sp reproduces in a way to reproduce using spores that live through shoots called blastospores [19].

*Candida albicans*is a fungus whose original habitat is in the human body. The fungus will cause problems and cause infection when the population is well developed. Meanwhile, Candida glabrata is a relatively non-pathogenic commensal fungal organism from human mucosal tissue. Candida ranks second as a cause of infection, namely oral, esophageal, vaginal and urinary tract. Candida parasilopsis is a major emerging human pathogen that has dramatically increased, is a species-significant cause and has infection of wounds and immunocompromised organ tissues. Candida dubliens is a fungal opportunistic pathogen that was initially isolated from a patient causing cutaneous infection.

Regarding matters related to these observations, in this case the patient experienced itching in the genitals, so that in the research that has been carried out, the patient has been declared positive for *Candida* sp where the patient often feels itching in the genitals. In this case, the disorder caused by the fungus is mycosis. Mycosis which has a very large incidence is dermatophytosis with candidiasis. Mycoses caused by Candida fungi show a wide spectrum of clinical presentations and can be classified as superficial, such as skin and mucosal infections.. In addition to Candida sp fungi in diabetes mellitus urine, Aspergillus fumigatus was found in the body, namely in the body as a mass of branching hyphae, but also produced a number of asexual spores as conidia, in this structure known as conidaphores.

Diabetes mellitus is a chronic disorder characterized by blood glucose levels that exceed normal values, which causes the formation of hyperglycemia, which increases blood sugar levels, urine as well as ketone compounds [11].

DM patients may experience infection, because the body's resistance mechanism to diabetes is low, these

complications are associated with diabetes, increased risk of infection, increased glucose levels in blood, tissue and urine. For women who have diabetes have extra sugar on the walls of the vagina. Sugar found in urine accumulates in the vulva to provide food for the life of the fungus.

Fungi are one of the main causes of infection in tropical and subtropical countries, for example in Indonesia. One that can be caused by fungi is called mycosis. Mycosis which has a very high incidence is dermatophytosis with candidiasis [14].

Candidiasis is a fungal infection caused by Candida sp. And includes a fungal infection that is always found attacking humans. Candidiasis is formed because there is an excess of fungal life which is normally present in small numbers [26].

This study, after the observations of Getas et al, stated that the prevalence of candidiasis was 20.5% in 44 female respondents who had DM with a probability of 0.002. Through a population of 108 people with type 2 diabetes, it was found that 92 people (85%) got xerostomia with candidiasis on fasting blood sugar levels, blood sugar levels 2 hours after eating also had various DM experiences.

The candida positive samples were evaluated by the presence of candida albicans colonies forming round and oval on a smooth surface, yellowish white in color with a yeasty aroma against SDA flat media (Saboraud Dextrose Agar). When microscopic examination of candida was found balstopora in microscopic preparations using methylene blue solution. For negative candida samples, no candida colonies were found in macroscopic testing using SDA flat media.

In SDA flat agar media (Saboraud Dextrose Agar) colonies other than candida can also live which produce data by obtaining false positive data during macroscopic testing, until macroscopic testing has not found candida blastospores. Colony life other than candida can be influenced by unsterilized fungal life media, irregular incubator temperature, long incubation duration of fungi in SDA media and contaminants during sample collection.

DM is a group of metabolic disorders in the main symptoms of hyperglycemia. The existence of various types of DM are included due to the complex interaction of genetic influences with the environment. Various pathological stages are involved in the development of diabetes, initially through the destruction of cells in the pancreas as a consequence of insulin deficiency, to the eventual abnormality in insulin resistance [3].

Endogenous factors that cause candidiasis for women with diabetes are due to increased sugar levels in the urine. These levels can stimulate the life of the candida fungus very quickly. Causes of obesity can also lead to the formation of candidiasis. Obesity causes frequent sweating to form skin maceration and can facilitate the invasion of candida and other disorders.

These observations can be used as consideration for subsequent observers in order to obtain very accurate research data again because the time of sampling carried out at the Regional General Hospital Prof. Dr. H. Aloei Saboe Gorontalo City Very few, due to the COVID-19 pandemic, so the samples I took were limited.

CONCLUSION

In accordance with observational data on 10 urine samples in patients with diabetes mellitus at the Prof. Regional General Hospital. Dr. H. Aloei Saboe Gorontalo City. The fungus Candida sp. was found, namely in media culture, Candida species were round, smooth, the color was creamy white and the colonies were shiny.

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