Isolate some Bacteria Depending on the Lifestyle Diabetics Patients.

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Abstract

Diabetes mellitus, describes a group of metabolic diseases in which the person has high blood glucose (blood sugar), either because insulin production is inadequate, or because the body's cells do not respond properly to insulin, or both. Patients with high blood sugar will typically experience polyuria (frequent urination), they will become increasingly thirsty (polydipsia) and hungry (polyphagia). The population of bacteria and microbes that live in our gut is called the gut microbiome. which are divided into two categories of useful (non-pathogenic) and harmful (pathogenic) bacteria. Disease occurs when the ratio of harmful to beneficial bacteria increases. It is known that these microbes play a role in various systems in the human body, including the immune system, allergies, inflammation in the body, and cancer. *Escherichia coli* bacteria *(E. coli)* is the most studied bacteria in the world. *E coli,* is a rod-shaped gram-negative bacterium that is commonly found in the lower intestine of warm-blooded animals. *E. coli* is also found in birds, fish and reptiles.

Key words:- Diabeties , *E.coli* , Microbial infection,gene,

1.Introduction

Diabetes is the ninth cause of death, which is increasing every year,it is a disease that It has involved about 422 million people around the world. This is a statistic announced by the World Health Organization. Also, according to this organization, 1.5 million people die every year due to high blood sugar. The incidence of this disease is increasing surprisingly (Ramachandran ,2014). There are three main types of diabetes: type 1 diabetes, type 2 diabetes, and gestational diabetes. In type 1 diabetes, the pancreas produces little or no insulin. It often occurs in children and is an autoimmune disorder. Type 2 diabetes is more common than type 1 and affects approximately 90% of people with diabetes. 1 occurs most often in adults over 40 years of age, although doctors have recently diagnosed type 2 diabetes in younger people. Type 2 diabetes typically involves insulin resistance, meaning the body does not respond to and metabolize insulin effectively. In some cases, type 2 diabetes occurs when the body does not produce enough insulin. Gestational diabetes only occurs during pregnancy in women who did not have diabetes before, but had high blood sugar during pregnancy. Most of the time, gestational diabetes resolves after pregnancy, but it can increase a woman's or her child's risk of developing diabetes in the future. Gestational diabetes can also put women at increased risk of complications such as preeclampsia during pregnancy. (Gastrointestinal society, 2021). The relationship between host organisms and microbial community affects the presence of environmental organisms. Genetic diversity in holobionts may change with changes in different symbiont populations, environmental needs, and different genetic processes. (Zamani, 2017).

It is estimated that the collection of microbes in our body is about 100 trillion cells, which includes 1000 species and 7000 strains (Qin et al., 2010). Since humans live in a symbiotic relationship with intestinal microbes, they provide them with constant sources of food, and in return, they use them in various ways, including digesting food, metabolizing vitamins, sugars, and fat. and amino acids, and strengthening the body's immune system, protect us against pathogenic bacteria or fungi and help us by providing the possibility of optimal brain development and subsequent functions (Geurts et al., 2013 and Honda et al., 2016). *Escherichia coli* contains common strains and pathogenic strains that are responsible for many human diseases (Jang et al.,

2017). Some strains that develop by acquiring virulence factors to facilitate tissue damage to the intestinal tract, these diarrheal disease-producing strains are known as diarrheal E. coli (DEC) (Vilalta, 2018). In the lower part of humans and warm-blooded animals, *E. coli* is naturally present. Normally, it colonizes the neonatal gastrointestinal tract within hours of birth and becomes the major facultative anaerobes in the colonizing human microbiota (Strockbine et al., 2015). *Escherichia coli* generally remains confined to the intestinal tract, where it maintains a beneficial relationship with its host. However, in a weakened or immunocompromised host, or when bacteria are introduced to other body tissues following trauma or surgical procedures, even common nonpathogenic *E. coli* strains can cause disease (Strockbine et al., 2015). . *E. coli* is primarily transmitted through consumption of contaminated food and drink, person-to-person contact, contact with animals, or contact with environments contaminated with faeces or fomites (Donnenberg, 2013). No convincing evidence of respiratory transmission has been documented. Most *E. coli* strains do not cause disease in healthy people, but there are specific pathogenic groups that are discussed further below, and members of which can cause disease in humans and animals. The aim of study investigating the relationship between lifestyle with the *Escherichia coli* bacteria of diabetic patient

2.Material and method

This study was conducted at al-kut city, In Al-Zahraa Teaching Hospital Fifty stool samples were collected, 40 were diabetes patients and 10 were healthy as a control group. their ages ranged from (18-61) year and and transported on the gel swabs of Carry Blair (This medium has a low nutrient content to stop the replication of organisms while maintaining viability, Sodium thioglycollate is added to impede oxidation, with a buffering agent to prevent overgrowth of enteric pathogens, the alkaline pH decreases the destruction of bacteria due to acid formation) after culture on MacConkey agar, EMB, hekton ,sabroud then aerobically incubated at 37° C 24h for morphological, biochemical testing. the sensitivity and resistane to antobiotic where checked with an antibiogram test for further investigation under biochemical analysis. VITIK was performed . Molecular diagnosis was used by the PCR method for detection gene for virulence factor and for antibiotics resistance.

3.Static Analysis

After collecting the raw data, inferential statistics methods are used to test the research hypotheses. In order to evaluate the comparison of people with diabetes and healthy people, analysis of variance, T-test, and Mann-Whitney test are used. Finally, to analyze and perform statistical tests, SPSS 20 software is used at a significance level of 0.05.

4.Results and discussions

The percentage of bacterial growth in this study was show in table (1) 4 types of bacteria and fungi (candida) , isolates were 92,5% (n =37) *E. coli*, 4.8% (n=19) *k. pneumonia* . 17.5% (n=7) shigella , 7.5% (n=3) *salmonella and all samples were appear candida.*

Table (1)Results Prevalence of the Microorganisims Culture

Type of bacteria	Patient	Control
E. coli	**37(92.5%)**	**10(100%)**
K. pneumonia	**19(47.5%)**	**3(30%)**
Shigella	**7(17.5%)**	**2(2%)**
Salmonella	**3(7.5%)**	**1(1%)**

Investigations of the antibiotic sensitivity tests in Table(2), it was show resistancy and sensitivity of bacteria that isolate from both in the patient and control groups, the samples showed more reaction to the disks containing the antibiotics Amikacin and Ciprofloxacin than to other antibiotics

Table(2), The Results of Bacterial Growth with Antibiotic Test

Antibiotic	Paitent		Control	
	(%)S:n	(%)R:n	S:n(%)	R:n(%)
Aztreonam	21(52.5)	19(47.5)	5(50)	5(50)
Amikacin	36(90)	4(10)	8(80)	2(20)
Gantamicin	28(70)	12(30)	6(60)	4(40)
ciprofloxacin	3(32.5)	27(67.5)	2(20)	8(80)
ciftadizem	15(37.5)	25(62.5)	3(30)	7(70)

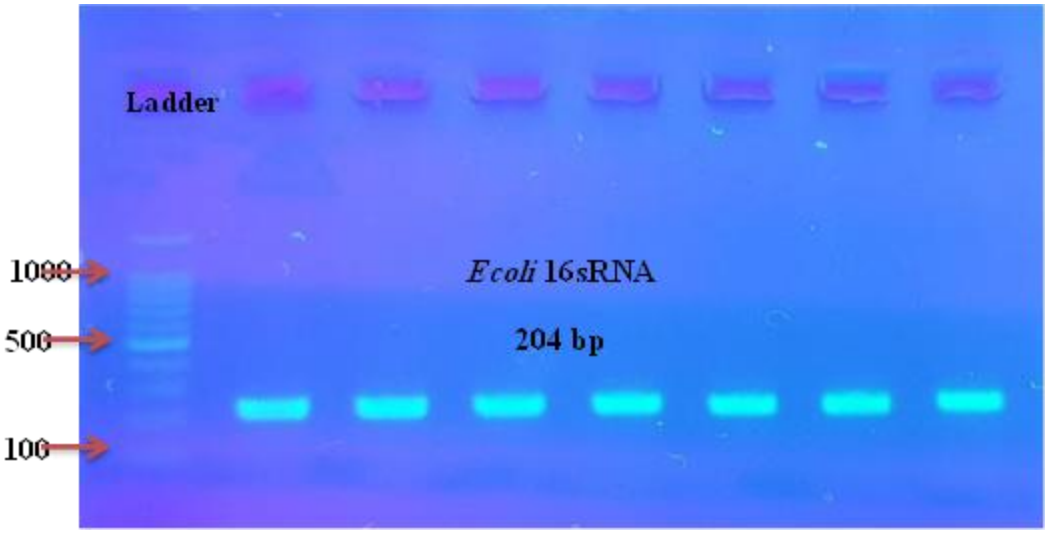
During this study, 50 stool sample from diabetes patients, both genders male and female . Bacterial growth percentage that isolated from total 50 collected sample was 40 paitent and 10 Control , *E. coli* in the Urpan 4.4% (n=11 P) and 0.5% (n=5 C) and in the Rular 6.4% (n=16 P) and 0.5%(n=5 C).

Table (3) the results of prevalence of bacterial in urban and ruler region

Bacteria	**Urban**		**Rural**	
	Paitent	**control**	**Paitent**	**control**
E.coli	**11(4.4%)**	**5(0.5%)**	**16(6.4%)**	**5(0.5%)**
K.pneumoniae	**6(2.4%)**	**0(0%)**	**13(5.2%)**	**3(0.3%)**
Shigella	**2(0.8%)**	**0(0%)**	**5(2%)**	**2(0.2%)**
Salmonella	**1(0.4%)**	**1(0.1%)**	**2(0.8%)**	**0(0%)**

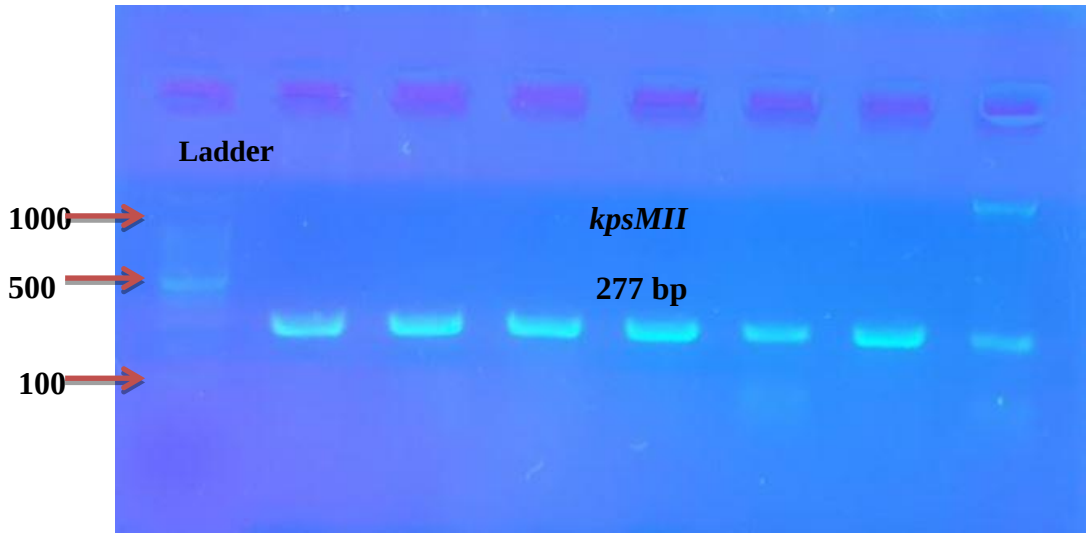
In the study conducted on pathogenic agents on 1% agarose gel, the amplification of *E.coli* 16s RNA gene on 1% agarose gel was show in Figure(1), which was observed in the bp240 band and indicates the amplification of the corresponding gene.

Figure (1) The Results of the Amplification of E.coli 16s RNA Gene on 1% Agarose Gel.



In the study conducted on pathogens on 1% agarose gel, the amplification of *E.coli* kpsMTII gene on 1% agarose gel was show in Figure (2), which was observed in bp277 of the band and indicates the amplification of the relevant gene.

Figure(2)The Results of *E.coli* kpsMTII Gene Amplification on 1% Agarose Gel



5.Conclusion

1. *E.coli* bacteria was the most common bacteria isolated from stool sample in diabetic patients.
2. According to living aera the *E.coli* distribution was in rular more the urpan and this can be the reason for the lack of information and awareness of patients who may have diabetes but are not aware of the disease that this requires a codified program for prevention and diagnosis in the less privileged areas of Iraq.
3. The spectrum and severity of infection in diabetes is essential for prevention and rapid treatment. Careful blood glucose control, appropriate selection of antibiotics, and source control are the cornerstones of management

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