



Research Article

## The Role of Microorganism in Gallstones Formation

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### KEY WORDS:

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**Abstract:** The aim of this research was to assess the prevalence of gallstones and antimicrobial susceptibility in patients with gallstones. It was carried out at the University of Fallujah, College of Medicine. Patients varied in age from 22 to 86 years old and there were 47 male and female patients in total, The average age 54, the number of male patients 5 and the number of female patients 42 were all diagnosed with gallstones and required treatment. Differential antimicrobials, obesity and diabetes all have different levels of risk. and details we collected from patients by filling out a special questionnaire. In all, there were 47 patients. By evaluating the susceptibility of bacteria that cause gallstones to antibiotics such as penicillin, the questionnaire indicated that the age group 30-40 years is the group that has suffered the most from other gallstones. (Ciprofloxacin, ampicillin, erythromycin, critrexone, tetracycline and Cefixime) as well as samples of different chemicals (Catalase production, Oxidase production, Coagulase production, Haemolysis and ..... etc).

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### INTRODUCTION

Brown dye contains a lot of bacteria, but cholesterol gallstones have a lot less. Gallstones are usually made up of many different types of stones. Gallstones have no documented natural past. Gallstones are created as bacterial and non-bacterial processes combine. The gallstone that is extracted during cholecystectomy is the culmination of a long pathologic phase. Gallstones are solid deposits in your gallbladder that form as a result of

digestive fluid. The gallbladder is a small pear-shaped organ that is situated below the liver on the right side of the abdomen. Gallbladder stones normally necessitate surgical removal of the gallbladder. Gallstones that don't cause any symptoms or signs usually don't need to be treated. Gallstones can take a variety of forms in the gallbladder, including: Stones made up of bile cholesterol. Gallstones of the cholesterol yellow variety are the most common. Gallstones are made up mostly of cholesterol

that hasn't been dissolved, but they can also include other additives and pigment gallstones. If the yellow liquid contains a lot of bilirubin, these stones may be dark brown or black in colour. When a gallstone blocks the gallbladder directly, cholecystitis is the most frequent cause. This causes bile to condense and stagnate, providing a perfect atmosphere for the growth of various germs and secondary infection from an intestinal organism, especially *E. coli* bacteria. The gallbladder wall gets inflamed after that (And in some rare cases the condition may accompany the death of some of the tissues that form the wall and may end up with an explosion of the gallbladder). As inflammation happens, it extends to surrounding tissues including the diaphragm, Intestine and liver, the aim of the study<sup>[1]</sup>. The role of microorganism in gallstones formation.

**MATERIAL AND METHOD**

**Culture media-blood agar:** Used to cultivate picky species and distinguish bacteria based on their hemolytic properties. Mueller hinton agar Most microorganisms may thrive in a rich medium. Antibiotic susceptibility monitoring is a popular application for it. Macconkey Agar Since Lactose and Neutral red are present, It is differential media. Lactose fermenting bacteria grow in red colonies, Whereas non-lactose fermenting bacteria grow in clear colonies. Mannitol salt agar: Is a staphylococci pathogenic staphylococci separation medium that is selective and differential. Identification of bacteria and fungi-Morphological identification of bacteria: Observations of colony morphology are a key fungus and bacteria recognition criteria<sup>[2]</sup>. Biochemical identification of bacteria: The biochemical reactions used to identify bacteria are described below. Bacitracin: Test Bacitracin is an antibiotic that prevents bacteria from synthesizing peptidoglycan, which is a key component of their cell walls. Blood agar is widely used to cultivate the bacterial lawn. Optochin test: Optochin distinguishes alpha-hemolytic streptococci from Viridans Streptococci. Spneumoniae are Optochin-sensitive bacteria. Catalase Test, Oxidase test: The oxidase test is used to determine which bacteria develop cytochrome *C. oxidase*, Coagulase Test, Voges-Proskauer reaction, Indole reaction *Shigella* Spp, *Edwardsiella tarda*, *Klebsiella oxytoca* and *Proteus vulgaris*, Methyl red test used to identify bacteria producing acids by mechanisms of mixed acid fermentation of glucose<sup>[3]</sup>. Citrate, Urease<sup>[3,4]</sup>, Hydrogen sulfide (H2S) H2S-producing microbes are *Salmonella*, *Edwardsiella*, *Citrobacter* and *Proteus* sp.<sup>[5]</sup>, Mannitol Salt Fermentation A pure culture from nutrient agar was sub-cultured on a freshly prepared plate of



Fig. 1: Microbial identification using the bio merieux VITEK

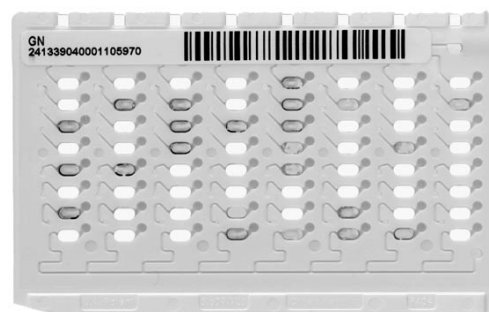


Fig. 2: VITEK 2 GN colorimetric identification card

Table 1: Card inoculation of suspension turbidities

Product	McFarland turbidity range
GN	0.60-0.70
GP	0.60-0.70
YST	1.90-2.30
BCL	1.90-2.30

mannito I salt agar. It was then incubated at a temperature of 37°C for 24 h. Growth of white colonies surrounded by yellow zones indicated presence of *Staphylococcus aureus* and then confirmed by Gram staining<sup>[6]</sup> and Urease Test Some bacteria can utilize urea as a non-carbohydrate carbon source using urease enzyme (Fig. 1).

**Reagent cards:** Each slit on the detector cards conducts a particular test and adjusts the chemical support structure. The chemicals that are modified calculate different processes related to the handling and use of foodstuffs, such as acid conversion, aqueous hydrolysis in the enzyme, development in the presence of dilution and stopping materials (Fig. 2).

GN-Gram-negative (alcohol change and production) GN-Gram-positive (alcohol change and production) GN-Gram-positive (alcohol change and production) GN-Gram-positive (alcohol change and production) GN-

Table 2: Gallstones patients are divided into groups based on their age, gender and other factors

Age	Sex		Pre. Op. Antibiotic		Diabetes Mellitus		Smoking	
	Male	Female	Yes	No	Yes	No	Yes	No
20-30	0	8	1	7	0	8	1	7
30-40	2	10	3	9	0	12	0	12
40-50	1	6	0	7	0	7	0	7
50-60	0	9	3	6	3	6	0	9
60-70	0	7	1	6	2	5	0	7
70-80	1	1	0	2	0	2	0	2
80-90	1	1	0	2	2	0	0	2

Table 3: According to the biochemical examination, bacteria are distributed differently

	<i>Streptococcus pyogenes</i>	<i>Streptococcus viridans</i>	<i>Staphylococcus aureus</i>	<i>Klebsiella pneumoniae</i>	<i>E. coli</i>	<i>Streptococcus spp.</i>
Catalase production	-	-	+	+	+	-
Oxidase production	-	-	-	+	-	-
Coagulase production	*	*	+	*	*	*
Haemolysis	+	+	+	-	-	+
Motility	-	-	-	-	+	-
Optochin	*	R	*	*	*	-
Bacitracin	S	*	*	*	*	-
Indole production	*	*	*	-	+	*
Vogesproskauer	-	V	*	+	-	-
Methyl red	-	-	-	-	+	*
Simmon citrate	*	*	*	+	-	*
Urease	-	-	+	+	-	-
H <sub>2</sub> S production	*	*	*	-	-	*
Mannitol Salt Fermentation	-	-	+	-	*	*

-: Positive test, +: Negative test, \*: The test was not conducted, V: Variable, R: Resistance, S: Sensitive

Table 4: Antibacterial research results show a distribution of bacteria species

species	<i>Streptococcus spp.</i>	<i>Staphylococcus aureus</i>	<i>E. coli</i>
Ciprofloxacin	S	S	S
Ampicillin	S	R	R
Erythromycin	S	S	R
Ceftriaxone	S	S	S
Tetracycline	S	S	S
Cefixime	R	R	R

Gram-positive (alcohol (chemical alcohol change and production) YST-GP-GP-GP-GP-GP-GP-GP-GP-GP-GP-GP (living organisms) Table 1 shows the BCL -Culture Requirements and Suspension Preparation.

**RESULT AND DISCUSSION**

Patients with 47 gallstones, ages 22-86 years, average age 54, 5 male patients, 42 female patients, all of them were contained in Table 2. Gallstones, unequal antimicrobial toxicity, smoking and asymmetric diabetes are just a few of them. And knowledge gained by a patient-specific questionnaire. Between the ages of 20 and 30, there are 0 men and 8 women, with 1,7 of them having gathered them. Earlier citation. Antibiotics and smoking, respectively, lead to diabetes 0,8. The group is 30-40 years old, with 2 men and 10 women, three of which are under the age of thirty. Previously stated. Antibiotics, asthma and smokers 0,12 are also related to

antibiotics. Class category 40-50 years, of 1 men and 6 women, of whom 0,7 are previously. In the past, Antibiotics and diabetes were also smoked at the same time. The age range 50-60 is made up of (0) men and 9 women, with 3,6 of them being women. Earlier citation. Smokers 0.9, Antibiotics and diabetes, respectively. Class party 60-70 years, of 0 men and 7 women, 1,6 of which are pre-menopausal. There was a previous reference. Antibiotics, diabetes 2,5, smokers 0,7 and age group 70-80 years, including 1 men and 1 women, among them 0,2. In the past, Antibiotics, asthma and cigarettes are all listed in the same sentence. 1 men and 1 women in the age group 80-90, of whom 0.2 are under the age of 80. In the past, Antibiotics and smokers, on the other hand, cause diabetes 2,0. There were 47 patients in all. The age range 30-40 years was found to be the most affected by other gallstones, according to the questionnaire.

The results in Table 3 of six types of bacteria in biochemical tests demonstrated that: *Streptococcus pyogenes*: This type of bacteria displayed a Bacitracin sensitivity, *Streptococcus viridans*: This type of bacteria showed a Bacitracin sensitivity<sup>[7]</sup>. Optochin resistance was found in this type of bacteria, *Staphylococcus aureus*: *Klebsiella pneumoniae* was shown to be uniformly negative in tests: It revealed that five samples were negative and five others were positive, including

*E. coli*: *Streptococcus* spp.: A negative result revealed six samples and a positive test revealed four more. Just four samples returned a positive result<sup>[8]</sup>.

The findings in table 4 showed that all of the antibacterials examined (Ciprofloxacin, Ampicillin, Erythromycin, Ceftriaxone and Tetracycline) were effective against the majority of the isolates (*Streptococcus* spp) (Cefixime). Antibiotics are unable to reach the outer membrane, reducing the drug's permeability. Resistance to (Cefixime) in *Streptococcus* spp may be due to the widespread use of these antibiotics in the treatment of most clinical infections<sup>[9]</sup> and that the majority of the isolates (*Staphylococcus aureus*) were resistant to the majority of the antibacterials examined (Ciprofloxacin, Erythromycin, Ceftriaxone, Tetracycline), with the exception (Ampicillin, Cefixime). Antibiotics are unable to reach the outer membrane, reducing the drug's permeability. Resistance to (Ampicillin, Cefixime) in *Staphylococcus aureus* may be attributed to their widespread use in the treatment of most clinical infections<sup>[10,11]</sup>. Most isolates (*E. coli*) were vulnerable to half of the studied antibiotics (Ciprofloxacin, Ceftriaxone, Tetracycline) except for the other half (Ampicillin, Erythromycin, Cefixime) and antibiotics could not reach the membrane's outer coating, which could minimize drug permeability. Resistance to (*E. coli*) antibiotics (Ampicillin, Erythromycin, Cefixime) may be a result of their widespread use in the treatment of clinical infections. As seen in Table 4, which summarized all of the details gathered from the antibiotic susceptibility test, the majority of isolates were susceptible to most antibiotics used in the sample, although some were moderate<sup>[12]</sup>.

The effectiveness of the urease and the viscous layer they create was shown by dye-negative microbes within stone components. The Gram-positive sympathetic streptococcus *Streptococcus viridans* is a wide group of streptococcus<sup>[13,14]</sup>. The most popular bacillus that causes inflammatory stones is Volatility, For these types of stones, the type mirabilis P. is the most common bacterial species capable of producing urea, accounting for more than 70% of the germs isolated from these stones, yet even because of its toughness<sup>[15]</sup>. Resistance to antibiotics administered by doctors is more common, according to this report. Without a question, constant surveillance of pathogen exposure to widely used antimicrobial agents in various population groups is important<sup>[16,17]</sup>. The findings of this analysis can be used to identify patterns in antimicrobial resistance, to develop local antibiotic strategies and to help clinicians make sound antibiotic therapy decisions to avoid antibiotic abuse or overuse<sup>[18,19]</sup>.

## CONCLUSION

Gallstones are caused by a pathogen that causes many gallstones (bacteria). Humans are the original cause of infection, as well as the organism's dissemination in culture, among other influences. Antibiotics are antibiotics that are used to prevent and cure diseases caused by bacteria, Antibiotic tolerance develops as bacteria adapt as a result of antibiotic treatment. Antibiotic-resistant bacteria are more likely to cause a complicated human infection than their non-resistant counterparts.

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