

# The Pathological Study of Acne

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**Abstract: Objectives:** To investigate the acne bacterial infection status, new guidelines should be established on treating whelk in skin. **Methods:** Total 58 cases liquid samples were collected from different levels, specimens were inoculated into blood agar in 3 hours, cultured for 18-24 hours under the constant temperature of 37°C. Distinguished positive strains or negative strains in a microscope with the method of Gram Staining. We used Oxidase test and the Catalase test to make sure the bacteria's species. We ensured the specific strains of the bacteria acquired with Biochemical tests. Each typical strain of the sample was purified and cultured. Sensitivity of bacterial were identified by Disk Diffusion Method. **Results:** Pathogenic bacteria covering *Staphylococcus epidermidis*, *Staphylococcus aureus* Rosebush, *Serratia fonticola*, *Serratia marcescens* and *Klebsiella terrigena*. Research data shows that the bacteria species mainly are *staphylococcus epidermidis* and *staphylococcus aureus*, while *Serratia fonticola*, *Serratia marcescens* and *Klebsiella terrigena* are rarely to be seen. The drug sensitive tests demonstrate that different bacterial performed variety sensitivity to specified antibiotics. The survey results show that skin and diet have certain effect on the onset of whelk, but people with oily skin are more likely to suffer from whelk. **Conclusions:** Whelk occurred to the young frequently and sometimes to the middle aged people. *Staphylococcus epidermidis* and *Staphylococcus aureus* played an important role on the cause of whelk. We should pay more attention on the prevention rather than treatment.

**Keywords:** Acne, Pathological Study, Drug Sensitive Test

## Introduction

Whelk is a chronic inflammatory skin disease of follicle sebaceous glands. Too much androgen, excessive secretion of sebum, follicular keratosis duct abnormalities, skin bacterial infection and inflammation, all of those play important roles on the pathogenesis of Acne. Whelk is one disease of disfiguring illness, acne can lead to not only discomfort localized lesions, but also psychological illness. Among the population, adolescent who are 12 to 24 years old up to 85 percent, for adults 3percent to 8 percent. Topical therapy and systemic therapy are the important west medical treatment of acne, topical therapy such as antibiotics and vitamin A acid preparations are taken in, systemic therapy include oral antibiotics, vitamin A acid and anti-androgen drugs. Although there have been new available formulations, there is no generally accepted ways to cure whelk so far. Interestingly, there is no scientific basis for standard treatment. In terms of etiology, bacteria tend to come from the normal flora of the skin, mainly staphylococcus, streptococcus, et. Resistance are likely to be produced while using antibiotic. So the bacterial drug resistance tend to be stronger. Without etiology diagnosis and drug susceptibility test results, the clinical effect might not as well as expected, what's more, tending to recrudescence. Especially today, the spread of "superbugs" caused panic all around the world, therefore it is imperative to use antimicrobial agents properly. In our study, we isolated the meaningful strains from cases, study bacterial susceptibility test, so as to screening strong

antibacterial effect drugs.

## Materials and methods

### Bacterial strains, identification, and antimicrobial susceptibility testing

Relevant strains were collected from undergraduates in one medical college in China Shandong province, including 33males and 25 females. Each of them were asked to fill in a personal information questionnaire, which covers diet, skin types, situation of medication and bacterial infections, to ensure that these factors will not affect the results.

Squeeze out pus from whelk, collect adequate pus in a sterile tube, inspection immediately. The cultivation of the bacterial and isolation is accordance with the "National Clinical Laboratory Procedures" (the third edition). All isolates were identified using VITEK32 and its matched card. K-B methods were used to detect antimicrobial susceptibility and results of susceptibility testing were interpreted according to CLSI guidelines.<sup>[1]</sup>

## Results

### Identification of isolates

A total of 58 isolates of cases including 44 *Staphylococcus epidermidis*, 3 *Staphylococcus aureus*, 1 *Serratia fonticola*, 1 *Serratia marcescens* and 1 *Kluyvera terrigena*.

### Antimicrobial susceptibility testing

We detect antimicrobial susceptibility of Gram-positive

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bacteria and Gram-negative bacterial respectively , we can see that some gram-positive were resistant to trimethoprim sulfamethoxazole, clindamycin and

erythromycin(table 1): on the other hand, some gram-negative bacterial all show sensitive to the antibiotics we did (table 2) .

**Table 1.**Antibiotic susceptibilities of gram –positive bacterial (resistant rate )

Isolate P	SAM	CRO	AMC	CXM	SXT	VA	DA	E	KZ	FOX	RD	
<i>Staphylococcus Epidermidis</i>	0	0	0	0	68.2%	0	15.9%	44.7%	0	2.3%	2.3%	66.7%
<i>Staphylococcus Aureus</i>	0	0	0	0	66.7%	0	33.3%	66.7%	0	0	0	100%

SAM, Ampicillin / sulbactam; CRO, Ceftriaxone; AMC, Amoxicillin-clavulanicacid; CXM, Cefuroxime; SXT, Trimethoprim sulfamethoxazole; VA, Vancomycin; DA, Clindamycin; E, Erythromycin;KZ, cefazolin;FOX, ceftioxin;RD, Rifampin;P, Penicillin

**Table 2.** Antibiotic susceptibilities of gram –negative bacterial(resistant rate )

<i>Serratia fonticola</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Serratia marcescens</i>	0	0	0	0	0	0	0	0	0	0	0	0
Isolate	SAM	CRO	AMC	CTX	CFP	TZP	SCF	PRL	IPM	MEM	ATM	CAZ
<i>Klebsiella terrigena</i>	0	0	0	0	0	0	0	0	0	0	0	0

[1]

SAM, Ampicillin / sulbactam; CRO, Ceftriaxone; AMC, Amoxicillin-clavulanicacid;CTX, cefotaxime;CFP, Cefoperazone;TZP, Piperacillin/tazobactam;SCF, Ketone cefotaxime / sulbactam;PRL, Piperacillin / tazobactam;IPM, Imipenem;MEM, Meropenem;ATM, Aztreonam;CAZ, Ceftazidime

### Discussion

Acne , also known as "whelk" is caused by plenty of factors which lead to a chronic inflammatory skin disease . Bacterial infection is essential for inflammatory reaction, endocrine and sebum secretion also play important roles otherwise [2]. In this study we found that the main pathogenic bacteria were *Staphylococcus epidermidis* and *Staphylococcus aureus*, followed by gram-negative bacteria,this is in accordance with zhivong Xia<sup>[3]</sup>and lijun Kong<sup>[4]</sup> .there is also some research demonstrate that *Propionibacterium acnes* and *Staphylococcus epidermidis* covered the most pathogenic bacteria <sup>[5,6,7]</sup>, since our study cultivate the pathogenic bacteria in the aerobic environment. *Propionibacterium acnes* belonged to anaerobic bacteria, we can say that our research arrived the same conclusion .

Our study revealed that *Staphylococcus epidermidis* were resistant to Erythromycin, penicillin and Trimethoprim sulfamethoxazole, it is nice to see that we still have many effective drugs to choose, like Ceftriaxone, Cefuroxime and Vancomycin. It is worthy of serious consideration to the rational use of antibiotics, particularly methicillin-resistant *Staphylococcus aureus* (MRSA) infection, has caused great concern all around the world<sup>[8,9,10]</sup> . The resistance of bacteria in the acne reflect the irregular use of antibiotics, and remind us the emergence of resistant strains.

In all, for bacterial infection acne, *Staphylococcus epidermidis* and *Staphylococcus aureus* were the main pathogen bacteria . In order to use antimicrobial agents rationally and effectively , choose drugs according to

susceptibility results, so as to slow down the speed of the drug resistant strains. What's more important is that a new guideline should be established on treating whelk in skin.

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