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Isolation and Identification of *Pantoea agglomerans* from Open Heart Operations Unit of Marjan Hospital in Hilla City

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Abstract

The nosocomial infection of *Pantoea agglomerans* has become an important cause of many systemic infections in humans, and considered of present study was to isolate and identify this pathogen from open heart operation unit of Marjan hospitals in Hilla city during a period from April to September 2018, (19) isolates of *Pantoea agglomerans*. Was isolated from (150) swaps which were collected from the environmental of open heart operation unit. 8/30 isolates from system, 3/35 from bed, 3/25 from earth , 3/35 from door and 2/25 from nurse hands isolated identification of microbes were done according on the morphological, cultural ,microscopically characterization and list of biochemical test. To emphasize the identification of *Pantoea agglomerans*. We used the API20 technique biochemical strips (biomerieux SA/ marc y-1 Etoile France).

The antimicrobial susceptibility pattern of the isolates was studied using different types of antibiotics. The microbes showed resistance to the routinely used antibiotics.

Key Words:- *Pantoea agglomerans, characteristic, Isolation, nosocomail, hospital.*

Introduction

Pantoea agglomerans is a Facultative anaerobic gram negative bacteria , previously named *Erwinia herbicola* [(1)] or *Enterobacter agglomerans* , motile with peritrichous Flagella non spore forming , commonly found in environment such as water , soil , dust , air , sewage , seeds of vegetables and food .As well as reported as both commercial and opportunistic pathogens of animal and humans [(2)] . *Pantoea agglomerans* is a opportunistic microbes can be isolated from different sites of hospitals such as wall , door , bed , floor , clothes of nurse , and also could be isolated from clinical specimens including blood , wounds , urine , throat , and stool[(3)]. *Pantoea agglomerans* is worldwide bacterium commonly isolated from plant surfaces , and many research has shown that *Pantoea agglomerans* can serve as a plant pathogen [(4)] . It was identified as a nosocomial pathogen to human in mid-1960 S . It could be a cause of opportunistic human infections , mostly by wound infection with plant material or by hospital-acquired infection especially in human with immune compromised [(5)] , the survey for infective agent is very important to reduce the occurrence of infection with different types of microbes , therefore to prevent spreading opportunistic microbes and spreading drug resistant bacteria between the patients the CDC recommends use of contact isolation , precaution , enhanced environmental cleaning , dedicated patient care equipment and reduce using of antibiotics . This study mainly aims to isolation and identification and determination the prevalence of *Pantoea agglomerans* from the hospital environment of open heart operation in Marjan hospital and to recognize the antimicrobial susceptibility.

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Materials and Method

One hundred fifty (150) swaps were collected from April to September 2018 from environmental locations of open heart operation of Marjan hospital Hilla city. The Swaps which was taken from system ,bed,doors,earth and nurse hand , was moistened by normal saline (2 ml) of sample was placed in sterile tubes containing brain heart infusion broth (BHT), transporting by ice box to

the laboratory [6], each sample was cultured in Luria Bertani (LB) agar by spreading methods , the plate were incubated at (37Cº) for 3 days , the colonies which appeared after that were transferred to slants of the same medium , then the colonies were collected according to the morphological , characteristics appearance ,agar surface and purified by culturing on nutrient agar plates , and identified with gram stain , and the main characters of colonies on solid medium such as shape , texture , and pigmentation for characterization the biochemical and physiological test , were used the isolates were maintained at (4Cº) and cultured in LB medium. The biochemical tests used for identification depending on macroscopic motility tests : oxidase ,catalase , indol , H_2S production vogas proskaner [7; 8] , for further identification various carbon sources used such as :glucose , xylose , mannose , Rhamnose , salicin , sucrose , Trehalose , maltose [9] . The identification was emphasized by using API20E (Biomerieux SA/ marcy_1 Etoile France) . The test done according to the manufactures direction , the systems were incubated at (35 ºC) and the results were read after(20-24) hrs. Stored for long time by the identified isolates were culturing in tryptic soy broth (TSB) with 20% glycerol at -20Cº (Merk co.) .

Antibiotic Susceptibility

The antibiotic susceptibility test was done according Kirby-Baner [10] disc diffusion method by using Muller Hinton agar plate . the antibiotic used : ampicillin (10 Mg) , carbenicillin (100 Mg) , ceftazidiume (30 Mg) , cefotaxime (30 Mg) ,imipenem (10Mg) , streptomycine (10Mg) , amikacin (30 Mg) , gentamycine (10 Mg) , tobramycine (10 Mg) , pipracillin (100Mg) , colistin (25 Mg) , tetracycline (30Mg).

Results

The results in **Table (1)** are summarized the total of (150) environmental sample , the highest number of of *Pantoea agglomerans* was isolated from system 8/30 (26.6%) followed by earth 3/25 (12%) , then bed samples 3/35 (8.57%) , door 3/35 (8.57%) and 2/25 (8%) for nurse hand sample .p

Table (1) : The number and percentage of *Pantoea agglomerans* isolated from differernt locations of open heart operation unit of Marjan hospital.

Location	No. of Sample	No. of *Pantoea agglomerans*	%
System	30	8	26.6
Earth	25	3	12
Bed	35	3	8.57
Door	35	3	8.57
Nurse hands	25	2	8

The results showed that [19] isolates was isolated from different environmental locations of open heart operation unit of Marjan hospital .were positive for catalase , simmon citrate , motile , negative indol , H_2S production and the other test**.**

The API20E test strips was used which emphasized that identification of [19] isolates have the same profile with systems indicate that the isolates are aerobic, ferment, galactose, lactose, glucose, arabinose , mannitol, inositol, rhamnose, maltose, melibiose and vogas proskauer was positive , indol negative, citrate positive.

The results of antimicrobial susceptibility was summarized in **Table (2)** .

All 19 isolates of of *Pantoea agglomerans* showed high resistance toward most antibiotics which mean that the isolates have multidrug resistance (MDR) and they can adapted to antimicrobial agents , this process enable these pathogens to oppose the action of certain antibiotics remanding the antibiotics ineffective .

Table (2) Antibiotic susceptibility of *Pantoea agglomerans*. ` N= 19

Antibiotic	Resistance %	Intremediate%	Sensitive %
Ampicillin	16(84.21)	3(15.78)	_
Carbenicillin	15(78.94)	3(15.78)	1(5.2)
Ceftazidium	7(36.8)	2(10.5)	10(52.63)

Cont... **Table (2) Antibiotic susceptibility of *Pantoea agglomerans*.** ` N= 19

Cefotax	10(52.63)	4(21)	5(26.31)
Impenem	3(15.78)	3(15.78)	13(68.42)
Streptomycin	11(57.89)	3(15.78)	5(26.31)
Amikacin	13(68.42)	2(10.5)	4(21)
Gentamycin	15(78.94)	4(21)	-
Tobramycin	10(52.63)	2(10.5)	7(36.85)
Pipracillin	6(31.5)	5(26.31)	8(42.10)
Colistin	-	1(5.26)	18(94.73)
Tetracydine	-	2(10.5)	17(89.47)

Discussion

The results of our study showed that, the isolation of [19] isolates of *Pantoea agglomerans* on pure culture , All the isolated colonies of yellow pigmented with slightly concave centers (5mm) in diameter , The isolates are a Gram negative rod and partially hemolytic sheep red blood cells.

The phenotypic characteristic of the isolates agree with the characteristic of *Pantoea agglomerans* Which described in the bergeys mannal of determinative bacteriology [9, 11] **.**

The identification of isolated pathogen was done by using several biochemical tests which summarized in **Table (2)** which showed that the characteristic of *Pantoea agglomerans* [12].

The results of identification ensured by API 20 system technique .

Recently the microbes of *Pantoea agglomerans* Regarded as opportunistic pathogen which cause severe infection when introduced in to system of humans or animals [13] .

The infection caused by this pathogen often involve patient that are already by other origin disease [14].

There are a little information about *Pantoea* spp . Especially in Iraqi hospitals . The result of this study showed that the occurrence of *Pantoea agglomerans*. In the open heart operation in Marjan hospital in Hilla city. This results are very important to clarify the possible role of *Pantoea agglomerans*. As a nosocomial pathogen in common parts of hospital infection and regarded as a first report of this pathogen in such part of hospital , survey for infective agent is very important to reduce the infection with different type of pathogen . In recent years there is an increased in nosocomial infection especially in neonate intensive care unit (NICN) also in oncology department ,these unusual microorganisms including *Pantoea agglomerans* . So the aim of present study was tried to isolate and determine the occurrence of *Pantoea agglomerans*. From hospital environmental of open heart operation in marjan hospital *Pantoea agglomerans*. Which isolated in this study showed multi resistant to many antibiotics used [15].

The antimicrobial resistance of *Pantoea agglomerans* are of great concern both in human and veterinary medicine wide world. Antibiotic resistance is a serious problem in the treatment of human and animal with microbial diseases [13]. The antibacterial susceptibility test *Pantoea agglomerans* Is done by disc diffusion method using the Kirby and Bauer technique [10] **Table (2)**

Pantoea agglomerans is an opportunistic pathogen and when in to human and animals organs caused severe diseases especially in fatal infection , the most serious are individuals with underlying diseases such as young Persons (16). Infection caused by *Pantoea agglomerans* is difficult to diagnosis. To our knowledge there is no previous report on the isolation and identification of *Pantoea agglomerans* from environmental of open heart operations of Marjan hospital . The results of our study showed that contamination of the environment unit with *Pantoea agglomerans* . These results is very important especially the isolated pathogens showed multidrug resistance to many antibiotics used in this study and have inherent capability to remain viable

and grow well at room temperature because ,of this the contamination occurred in these parts of hospital .

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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