

## Evidence of Multi-drug resistant group G streptococci (GGS) in the Pediatrics Ward at Tikrit Teaching Hospital

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### ABSTRACT:-

A hospital-based cross sectional study was conducted in the pediatric wards at Tikrit Teaching Hospital from June 2005 to the end of August 2005. Swabs were taken from innate objects and medical personnel in the pediatric wards, culture and identification was performed using conventional methods. Grouping using an available commercial kit were also performed for all Streptococcal isolates, with biochemical and antibiotic sensitivity tests. Group G streptococci (GGS) was found to account for 52.5% of the total streptococcal isolates (90.4%) isolated from the innate objects, while it was 47.9% of the streptococci isolated from the medical personnel (42% from hands, 32% from oral cavities, and 26% from the clothes). Data revealed that 22.6% of the GGS strains were multi-drug resistant against gentamicin, ampicillin, amoxicillin and erythromycin. The data suggests the importance of multi-drug resistant GGS in the pediatrics ward and that it may involve in many infections there.

اثبات مقاومة بكتيريا الستريبتوكوكس الماخوذة من جناح الاطفال في مستشفى تكريت التعليمي للعديد من المضادات الحيوية

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### المستخلص:-

أجريت هذه الدراسة المقطعية في مستشفى تكريت التعليمي في ردهة الأطفال خلال الفترة من حزيران 2005 ولغاية نهاية شهر آب 2005. تم اخذ مسحات من بيئة ردهة الأطفال والعاملين فيها. وتم زرع العينات وتشخيصها باستخدام الطرق التقليدية. تم تشخيص المكورات السبحية على أنها من نمط "جي" باستخدام الكتات المتوفرة في الأسواق المحلية مع إجراء الفحوصات البايوكيميائية وفحص الحساسية للمضادات الحيوية. وجد ان المكورات السبحية نمط "جي" كانت تمثل 52.5% من مجموع عزلات المكورات السبحية المعزولة من بيئة الردهة، بينما كانت تمثل 47.9% من مجموع عزلات المكورات السبحية المعزولة من العاملين في الردهة (42% من الأيدي، 32% من التجويف الفموي، و26% من الملابس) أظهرت النتائج أيضا أن 22.6% من عزلات المكورات السبحية نمط "جي" كانت لديها مقاومة لمعظم المضادات الحيوية مثل : gentamicin, ampicillin, amoxicillin و erythromycin. تدل النتائج على أهمية هذه العزلات المقاومة للمضادات الحيوية من المكورات السبحية نمط "جي" في ردهات الأطفال وإمكانية ضلوعها بالكثير من الالتهابات في تلك الردهات.

### INTRODUCTION:-

There is increasing interest in the role of Lancefield group G streptococci (GGS) as emerging nosocomial and opportunistic pathogens [1]. In recent years, GGS have been reported with increasing frequency as the cause of a variety of human infections, such as pharyngitis, cellulitis, meningitis, endocarditis, and sepsis [2]. GGS are widely distributed in nature and are recognized as both commensals and pathogens in animals as well as in humans. The taxonomy of these

organisms has been re-evaluated in recent years. The Lancefield group G carbohydrate may be encountered in several  $\beta$ -hemolytic streptococcal species, including *Streptococcus anginosus* and *S. canis*, but mainly in *S. dysgalactiae* subsp. *equisimilis* [3]. Epidemics of GGS infection was reported in many western countries including France and USA [1, 4]. In Middle East, GGS has been reported also in Palestine [5]. GGS were isolated from patients and from numerous atmospheric specimens, dialysis machines, and from the hospital staff [4]. The present

study in the pediatric wards at Tikrit Teaching Hospital (TTH), we aimed to evaluate the size of GGS as nosocomial strains (whether they're in the atmosphere or harbored by hospital staff) via a hospital-based cross-sectional study, since we have no reports concerning GGS in Tikrit Teaching Hospital yet.

#### **METHODOLOGY:-**

A hospital-based cross sectional study was conducted in the pediatric wards at Tikrit Teaching Hospital from June 2005 to the end of August 2005. Swabs were taken from innate objects in the pediatrics ward including the doors' knobs of each room, its floor, the desks, and toilets of the wards. Also, swabs from 37 medical personnel were taken, including their hands, clothes, and their oral cavities. All the swab specimens were cultured onto blood agar plates within one hour after sampling, incubated overnight at 37°C, and conventional methods were used for isolation and identification of streptococci, then grouping using a sensitive latex test via an available commercial kit (PASTOREX<sup>®</sup> STREP, France). Biochemical tests and antibiotic susceptibility testing using the Kirby-Bauer method were performed for all GGS isolates [1].

#### **RESULTS:-**

The collected data showed that among 52 swab specimens taken from 13 rooms, streptococci were isolated from 47 (90.4%) of them with a total of 59 streptococcal isolates. The Group G streptococci (GGS) isolates were 31 isolate (52.5% of total streptococci isolates as shown in Fig.(1)); other groups of streptococci came in lesser frequencies. The specimens collected from the pediatrics ward's staff showed that among 111 collected specimens, streptococci were encountered in 96 (86.5%) of them, with 144 isolates. Group G streptococci (GGS) isolates were 69 isolates (47.9% of total streptococci isolates). Most GGS isolates were found in hands (42%), while in oral cavities it is found to be 32% and 26% in clothes. Fig.(2). Table (2) shows the antibiotic susceptibility test of the GGS isolates from the pediatric wards atmosphere and medical staff. Data showed that among 31 total GGS isolates, 7 of them (22.6%) were multi-drug resistant. Also, data

clarified that most of the resistant strains were especially resistant to the drugs used routinely in the pediatrics ward in TTH like gentamicin and ampicillin.

#### **DISCUSSIONS:-**

In the past 3 decades, group G streptococcus has been surfaced as an important opportunistic and nosocomial pathogen. Although more precise organism recognition accounts for a portion of these cases, there can be little doubt that the group G streptococcus has become a more prevalent pathogen [1]. In recent years, streptococcal infections are extremely common despite the overall susceptibility of these organisms to antibiotics, especially penicillin. While infections caused by the Lancefield group A streptococcus (GAS or *Streptococcus pyogenes*) have dominated the streptococcal medical literature, Lancefield groups G share many microbiologic and clinical characteristics with GAS and are now appreciated to produce infections quite similar to GAS although they more commonly cause opportunistic and nosocomial infections than GAS [2]. In the present study, the Group G streptococci (GGS) isolates recorded 52.5% of the total streptococcal isolates. Also it was found that among streptococci collected from the pediatrics ward staff, GGS accounted for 47.9% of them. This high prevalence of GGS in hospital environments and hospital staff either as a normal flora in the oral cavity or as a contaminant on their hands and clothes must take more consideration and attention because serious infections and complications like toxic shock like syndrome, necrotizing fasciitis, rheumatic fever, pneumonia, cellulitis, septicemia, meningitis and arthritis, once believed to be exclusively from Group A streptococcus (GAS) are now confirmed to be from GGS [1,6, and 7]. This may be due to acquisition of GAS like virulence factors by GGS through interspecies gene transfer [8, 9]. Data shows that all GGS strains were sensitive to cephalothin, cefotaxime, tobramycin, and ciprofloxacin (Table 2). This is in accordance with what was found by Mathur et al [10] from India, Woo et al [11] from Hong Kong, and Kim et al [12] from Korea. Data also showed high resistance

against gentamicin, ampicillin, amoxicillin and erythromycin. This is, perhaps, because these drugs are commonly used in the pediatrics ward by our physicians, and the continuous administration of these antimicrobials was leading to this high resistance behavior compared with other drugs that are either not given for children or given in less frequency.

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