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Comparison Between the Effect of Lincomycin and Azithromycin on Streptococcal Pharyngitis

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Abstract

Acute follicular tonsillitis is a common disorder that affects mainly pediatric and teenage age groups. Although it is highly curable, there are still many complications (like rheumatoid arthritis, valvular heart disease, middle ear infection, meningeal infection, and sinusitis) that make this infection in group A streptococci (G.A.S.) require proper and fast treatment. Azithromycin macrolide antibiotics have been used for a long time as a substitute for lincomycin antibiotics, whereas penicillins were shown to be allergic for some patients.

Aim of the study: to assess the potency of either azithromycin or lincomycin on G.A.S. pharyngitis

Patients and method: 84 patients with acute pharyngeal infection with G.A.S. were enrolled in this study and divided randomly into two equal groups. Group A received azithromycin, and group B received lincomycin. Both groups received their treatment for 5 days, after which rapid strep test (RST), leucocyte count WBC, and C-reactive protein (CRP) were done and compared to the 1st day of identification. Statistical analysis was done to evaluate the statistical significance of tested drugs. Results: Overall, the results demonstrate that lincomycin has a higher rate of curing G.A.S. tonsillitis than azithromycin, making it a preferred antibiotic agent.

Introduction:

Acute tonsillar infection (ATI) is one of the most common bacterial infections that attack the tonsils in the pediatric age group, especially after 2 years old. It is common in the winter but may occur at any time during the year [2]; the commonest cause of ATI is in group A streptococci, which are gram-positive bacteria usually activated after exposure to a cold environment [3]. The symptomology of ATI varies from a simple clinical picture like mild headache, arthralgia, loss of appetite, and malaise to severe conditions characterized by high-grade fever, episodes of febrile fits, especially at the 1-6-year-old age group, disorientation, mental confusion extending to unpredictable complications like sinusitis, and even acute bacterial meningitis [4].

The disease is diagnosed clinically, and in undiagnosed cases, a laboratory test, like a throat swab, is used for culture and sensitivity. A rapid strep test (R.S.T) involves applying a cotton swap piece to the surface of the inflamed tonsil and directly examining the swap for culturing and sensitivity [5].

The rational treatment of ATI is by general non-pharmacological treatment like drinking warm liquids, using antipyretics on need, improving feeding, and improving personal hygiene to prevent the spread of the disease [6]. If no response occurs, antibiotics become necessary, including the use of a variety of drug classes like penicillin, macrolide antibiotics, and cephalosporin family members like ceftriaxone [7]. In recent clinical practicing, macrolide antibiotics, especially azithromycin (protein synthesis inhibitor for bacteria acting as bacteriostatic agent and in higher doses become bactericidal), are used widely because of their safety, proposed effectiveness and ease of use since it is given once daily however, many reports suggested that this drug became less effective because the emergence of resistant strains due to drug misuse [8].
Lincomycin belongs to the lincosamide antimicrobial group, which inhibits bacterial protein biosynthesis and causes death. This drug was used widely, but its use was reduced owing to the emergence of developed antibiotics, especially the macrolide group [9]. Other causes that reduce the use of lincomycin include the risk of developing pseudomembranous colitis if used orally for a long time. Still, its efficacy in eradicating gram-positive bacteria keeps it in clinical use [10].

Patients and Method:
The study was conducted in the last winter months (November 2023- February 2024), and 84 patients between 8 and 12 years old were enrolled in this study and admitted to the consultant clinic in Kerbala General Pediatric Hospital. This patient was divided into two groups: group A, who received azithromycin 250 mg single dose daily for 7 days, and group B, who received 300 mg twice daily lincomycin for 7 days (the dose was decided according to body weight by the paediatrician). The R.S.T, WBC count, and CRP were done for all children before and after treatment. The data were investigated using t-test and Q-square tests to evaluate which drug was more effective.

Results and Discussion:
The overall results emphasized that lincomycin has greater outcomes when used for the treatment of acute tonsillitis, as shown in the listed tables below:
Table (1) shows the difference in PCR levels before and after treatment with either drug. The data expressed as mean + SD:

Drug	PCR before treatment	PCR after treatment	P value
Lincomycin	23±3.782	8±1.724	<0.005
Azithromycin	22±4.655	16±3.544	**0.0712**

Table (2) shows the difference in WBC levels before and after treatment with both drugs. The data expressed as mean + SD:

Drug	WBC before treatment	WBC after treatment	P value
Lincomycin	12890±1980	7870±1189	<0.005
Azithromycin	11040±1752	10600±1539	**0.558**

Table (3) shows the difference in the number of patients with positive TEST after treatment with other drugs:

	RST +	RST-
Lincomycin	12 (20.50) [3.52]	30 (21.50) [3.36]
Azithromycin	29 (20.50) [3.52]	13 (21.50) [3.36]

These results show that lincomycin has many favourable pharmacological and clinical effects on azithromycin. Here, the potential to reduce reactive leucocytes to normal was going with the use of lincomycin, possibly due to its rapid killing effect [11], enhancing immune response and cytokine release [12], while azithromycin is known to reduce the release of some cytokines [13]. On the other hand, PCR levels were noticed to be highly reduced by using lincomycin, which is explained by the earliest induction of bacterial killing capacity more than azithromycin [14], which confirms that lincomycin has great benefits in reducing late complications of acute tonsillitis if treatment delayed in induction or in its onset [15]. This finding is confirmed when RST is performed, as mentioned above, with a high edge of clarity from bacterial presence using lincomycin. Nowadays, penicillins show failure in the eradication of G.A.S bacterial [1], pushing paediatricians to use effective alternatives, especially if penicillin allergy is there, and azithromycin is still used worldwide with noticed reduced efficacy [16], making scientists researching to find out more sophisticated therapy.

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