Antibiotic Cocktail and Its Affect on Streptococcus mutans

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Antibiotics can be prescribed for infections too early, often, incorrectly dosed, or without consideration for least potent dosage first. Fortunately, some doctors practice caution when prescribing antibiotics for the same infection due to the evolving antibiotic resistant nature of bacteria. This research explored the effects of the most commonly prescribed antibiotics (amoxicillin, azithromycin, cephalexin) for Streptococcus mutans infections individually, as well as in combination, resulting in 7 treatment groups. The likelihood of dosage effect (18ug/15uL, 5 ug/15uL, 0.5ug/15uL) across treatment was also explored. There was a main effect of concentration with mean zone of inhibitions=49.9mm, 41.6mm, 30.9mm, decreasing respectively. Amoxicillin had the greatest main effect for antibiotic (u=47.1mm) followed by the combinations of amoxicillin/cephalexin (u=44.9) and amoxicillin/azithromycin (u=44.5mm). Lastly, interaction between treatment and antibiotic concentration indicated all three doses were different for each antibiotic combination. At higher doses, it was more difficult to detect the difference between the antibiotic treatments. The effectiveness of an antibiotic increased in combination with amoxicillin. Cephalexin was not as effective as azithromycin at the lowest dose, but more effective at the other two doses. Therefore, all three antibiotics killed Streptococcus mutans, with amoxicillin being the most effective. Amoxicillin increased the potency of other antibiotics when present, and cephalexin indicated a greater dosage effect than the other antibiotics. Doctors should err on the side of caution, and prescribe cephalexin first for Streptococcus mutans infections, and explore antibiotic combinations for resistant infections.

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