The Effect of Antibacterial Toothpaste on the Ecology of Oral Flora

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This project was designed to study how triclosan in antibacterial toothpaste affects the ecology of the oral flora. 41 participants brushed with non-antibacterial toothpaste twice a day for 7 days, after which saliva samples were taken, diluted using isotonic saline, and incubated in blood-agar petri dishes. This process was repeated after participants brushed with antibacterial toothpaste, following the same procedure. After incubation, bacterial colonies were counted, and morphology of colonies was compared by observing hemolysis, colony size, shape, and color. Gram staining and catalase testing were also used to examine bacteria morphology. Two scenarios were generally observed when analyzing the colony data. In one scenario if no one strain was prevalent before the use of triclosan, then after the use of triclosan, the bacterial count tended to be higher, larger more aggressive colonies were more prevalent, and hemolysis increased throughout the dish. The other scenario was that if a prevalent strain was present before the use of triclosan, then after triclosan use, this strain was eliminated or reduced, other new strains rose to prominence, and hemolysis increased throughout the dish. This shows that antibacterial toothpaste altered the balance of the oral flora, reducing competition for remaining strains, and providing opportunity for aggressive or triclosan-resistant strains to grow to higher concentrations. With antibacterial toothpastes enjoying widespread use this data shows that antibacterial toothpaste could be putting consumers at higher risk of infection than toothpaste that does not contain triclosan.

Awards Won:
ADA Foundation: First Award of $2,000