

Research Article

Scardovia wiggisiae prevalence among adult and pediatric orthodontic and non-orthodontic patient populationsAdam Whiteley¹, Karl Kingsley^{2*}

¹Adam Whiteley, DMD is an Orthodontic Resident at the University of Nevada, Las Vegas - School of Dental Medicine, Department of Advanced Education Program in Orthodontics and Dentofacial Orthopedics, 1700 W Charleston Avenue, Las Vegas, Nevada, 89106, USA, (702) 774-2690; Adam.Whiteley@sdm.unlv.edu.

²Karl Kingsley, PhD, MPH is Director of Student Research and Professor of Biomedical Sciences at the University of Nevada, Las Vegas - School of Dental Medicine, Department of Biomedical Sciences, 1001 Shadow Lane, Las Vegas, Nevada, 89106, USA, (702) 774-2623; Karl.Kingsley@unlv.edu.

The newly discovered cariogenic pathogen *Scardovia wiggisiae* has prompted dental and oral health researchers to screen for prevalence among existing saliva repositories. Five separate studies at this institution among both pediatric and adult populations have revealed similar findings that approximately one-quarter of patients harbor this organism. The data comparing non-orthodontic patients with patients undergoing orthodontic treatment and therapy has found much higher prevalence among pediatric (but not adult) orthodontic patients. These data suggest pediatric patients may be at much higher risk although more research will be needed to contextualize and understand these results.

Keywords: Scardovia wiggisiae, Pediatric, Adult Saliva Screening

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Introduction

The recent discovery of a novel cariogenic pathogen *Scardovia wiggisiae* has led many scientists and oral health researchers to re-evaluate and re-examine existing saliva repositories to determine the prevalence among patient populations [1-3]. Recent efforts at this institution have used existing saliva samples to determine the prevalence among both adults and pediatric patients [4-6]. These studies have revealed this organism may be found in approximately one-quarter of all samples tested.

However, the introduction of orthodontic brackets has traditionally increased the risk of caries lesions and the growth of cariogenic organisms—which may suggest the prevalence of this organism may be different among orthodontic patient populations [7,8]. To determine if any differences could be found among the adult and pediatric orthodontic patient population, retrospective screenings of previously collected orthodontic patient saliva [9-11] were

performed. These studies revealed a similar but slightly lower prevalence among adult orthodontic patients but a much higher (almost twice) prevalence among pediatric orthodontic patients [6,11].

Although these data have been generated from retrospective analysis of existing saliva repositories, the results to date strongly suggest an inverse, age-dependent relationship between orthodontic treatment and *Scardovia* prevalence. Higher percentages of pediatric (younger) orthodontic patients in both studies harbored this organism, while no similar finding was observed among adult orthodontic patients.

Based upon these observations a more thorough analysis and review of studies from this institution was undertaken to assess the cumulative evidence from these studies in a comprehensive and systematic manner.

Results

From the several studies undertaken at this institution,

*Correspondence: Karl Kingsley, PhD, MPH, Department of Biomedical Sciences University of Nevada, Las Vegas-School of Dental Medicine 1001 Shadow Lane, Tel:(702)774-2630,Fax:(702) 774-2721,E-mail:Karl.Kingsley@unlv.edu

combined averages for the prevalence of *S. wiggisiae* from both pediatric and adult were plotted (Figure 1). These data clearly demonstrate that averages in oral prevalence are similar among these two populations (22% and 23%), which are similar to findings from other studies of this organism [1,7]. However, the analysis of prevalence among patients with orthodontic brackets demonstrates a significant and contrasting result. More specifically, the prevalence of adult orthodontic patients appears similar but lower than in adult or pediatric patients, while the average for pediatric orthodontic patients is nearly twice as high than non-orthodontic patients.

In order to more accurately assess the data regarding *S. wiggisiae* prevalence, specific results from each individual study were used to create a Forest plot to provide a more comprehensive analysis of this information (Figure 2). These data clearly demonstrate that although each study was completed at different times using different samples, the prevalence of *S. wiggisiae* among non-orthodontic patients was found to be within a narrow range between 19% and 26%. In contrast, the data from the two pediatric, orthodontic studies were also found to be similar but at much higher levels (between 31% and 44%).

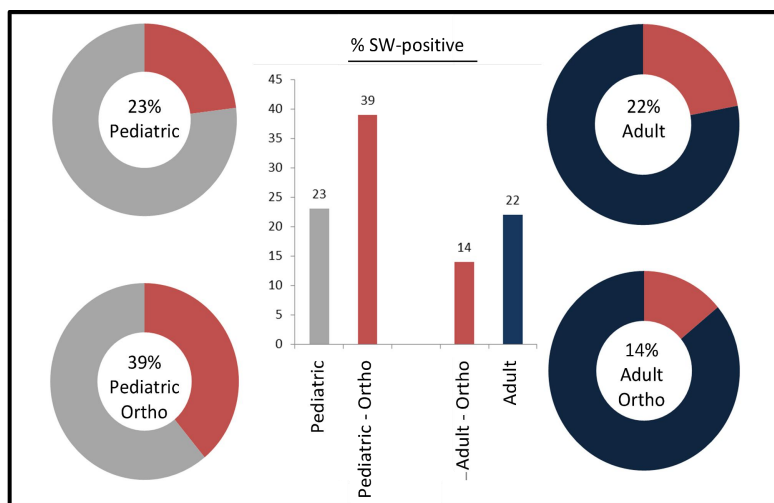


Figure 1. Analysis of combined *Scardovia wiggisiae* prevalence from UNLV-SDM studies. Data regarding *S. wiggisiae* from five studies were sorted by patient type (pediatric, adult, orthodontic, non-orthodontic) were plotted to determine average prevalence. This revealed much higher averages among pediatric, orthodontic patient saliva samples.

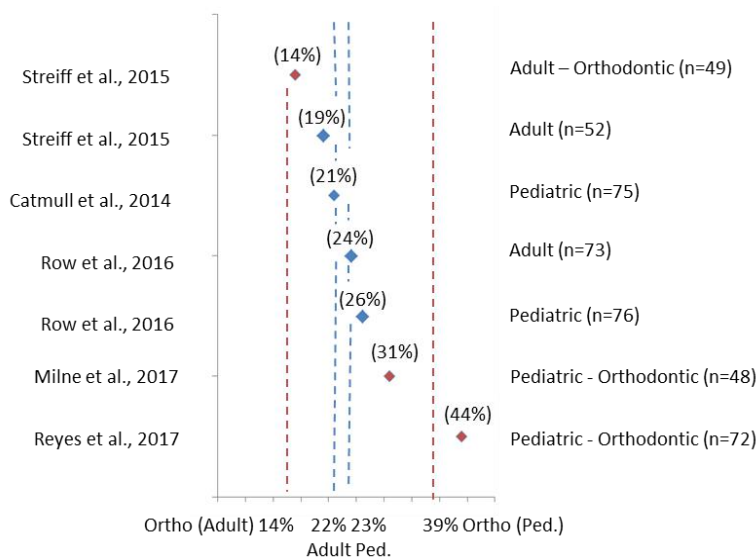


Figure 2. Forest plot of individual UNLV-SDM studies of *Scardovia wiggisiae*. Data for each sub-group (adult, pediatric, orthodontic, non-orthodontic) were sorted and plotted with sample size (n) and prevalence (percentage, %). Non-orthodontic samples were found to have similar prevalence (19-26%), while orthodontic samples among pediatric patients demonstrated much higher proportions (31% and 44%).

Conclusions

Due to the recent discovery of *Scardovia wiggisiae*, few studies have gathered sufficient information to provide information regarding prevalence – particularly among high-risk populations. The combined data from each of the five studies at this institution provide strong evidence that prevalence is similar among pediatric and adult populations, however those pediatric patients undergoing orthodontic therapy and treatment may exhibit much higher prevalence of this organism for reasons that have yet to be elucidated. More research will be needed to discover the underlying reasons for these findings and to determine if the presence (or absence) of this organism may be related to higher or lower caries risk.

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Conflicts of Interest

None

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