

## Ear infection study



Professor Matti Uhari

Xylitol Chewing Gum significantly prevents ear infections in children. The study conducted by the Department of Pediatrics at the University of Oulu shows a clear decrease in the occurrence of ear infection among the children who used chewing gum containing xylitol.

The aim of the research was to examine whether xylitol, which reduces the growth of *Streptococcus pneumoniae*, might have clinical importance in the prevention of acute *otitis media* (ear infection).

### The study was performed as a randomised double trial

A total of 306 children (150 girls and 156 boys) participated in the study. The study was performed as a randomised double trial in 11 ordinary day care nurseries in the city of Oulu in northern Finland. The mean age of the children was 5 years (youngest participant 1.5 years) and the monitoring lasted over a period of two months.

The study subjects were randomly divided into two groups. The subjects of the first group were instructed to chew two pieces of 100 % xylitol sweetened gum five times a day immediately after meals or snacks with a total dose of 8.4 g of xylitol a day. The chewing lasted until there was no taste left or for at least five minutes. The subjects of the other control group were instructed to chew sucrose flavoured gum.

The parents were asked to proceed with normal dietary routines but to avoid the use of additional xylitol during the study. Children in whom dental caries was noticed were advised not to participate in the study. The control group exposed to sugar for the short duration of the study did not suffer a higher incident of dental decays than the group chewing xylitol sweetened gum. This was verified at the dental health examinations performed four months after the trial.

### A clear decrease in the occurrence of ear infection

The study shows a clear decrease in the occurrence of acute *otitis media* among the children who used chewing gum containing xylitol. As the trial was a double blind study and the control group used chewing gum sweetened with sucrose, the decrease cannot be due to any mechanical factors.

An earlier study indicates that xylitol reduces the growth of *S pneumoniae*. This is the most probable mechanism in the observed prevention of *otitis media*. The total number of attacks of acute *otitis media* was 43/149 among the children in the sucrose group compared with 22/157 among the children who received xylitol. Thus xylitol sweetened chewing gum reduced the occurrence of *otitis media* by about 40 %. Significantly fewer antibiotics were prescribed among those receiving xylitol.

### The sufficient daily dose and regular use essential

The sufficient daily dose of xylitol is not known, but 8.4 g daily in chewing gum seems to be effective. Among those children who occasionally forgot to chew xylitol sweetened gum ear infections occurred more often than among those who chewed regularly.

The research on the effects of xylitol on ear-infecting bacteria was led by Associate Professor **Matti Uhari** of the Department of Pediatrics at the University of Oulu. According to Professor Uhari, the research proves for the first time xylitol's ability to decrease ear inflammations. "No other corresponding method has been found to reduce ear infections in children as dramatically", Professor Uhari says.

The study indicates that children who chewed less xylitol chewing gum had more ear infections compared to those who chewed the daily dosage of 8.4 g regularly. In Professor Uhari's opinion the findings indicate that lower dosages of xylitol are less effective. Ear infections decreased by 50 per cent

Chewing xylitol chewing gum did not reduce the carriage of pneumococcus bacteria in the nasopharynx. Thus, xylitol did not eliminate the bacteria causing the ear infection, but prevented the development of an ear infection. "Regular and quantitatively adequate chewing of xylitol sweetened gum decreased the development of ear infections by 50 per cent", says Professor Uhari.

"We had to choose sugar flavoured chewing gum for the reference group because sugar is a common substance in nutrition. It was also necessary to eliminate the unknown effects of artificial sweeteners in the study results," Professor Uhari says. The teeth of the children using sugar flavoured chewing gum were examined four months after the study. According to Professor Uhari the examinations showed no difference in dental caries between the treatment groups.

### Chewing xylitol gum is fun

The municipal day care nursery of Myllyoja in the city of Oulu is one of the eleven nurseries that took part in the research on xylitol's effects on ear infections conducted by the Department of Pediatrics at Oulu University. The use of xylitol has continued in the day care nursery also after the study.

### Use of xylitol in children's day care nurseries spreads rapidly

Liisa Sakko, Director of the day care nursery of Myllyoja, says that the use of xylitol in children's day care nurseries has spread rapidly: "In Oulu and the surrounding area xylitol is being used in almost every day care nursery. I think this is mainly due to the convincing scientific results. Xylitol has proved to be a very practical and efficient instrument in preventing dental caries and as the recent study shows, xylitol also prevents ear infections."

Using 100 per cent xylitol sweetened chewing gum and other xylitol products immediately after meals and snacks has become a regular and permanent routine in Myllyoja's as well as in many other day care nurseries. "The children are the first ones to remind us, if they don't see gum on the table. Those too small to chew gum are given liquid xylitol mixture instead."