

**UPPER RESPIRATORY TRACT CARRIAGE OF  
*STREPTOCOCCUS PNEUMONIAE* AND  
*HAEMOPHILUS INFLUNZAE* AMONG HEALTHY  
CHILDREN OF AGE 0-15 YEARS, AND THEIR  
ANTIBIOTIC SENSITIVITY PATTERN**

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## ABSTRACT

The study population was consisted of 900 healthy children. Nasal and throat swabs were collected from each subject and were processed in the laboratory of the Department of Microbiology, Faculty of Medicine, Colombo between November 1996 to September 1997.

The pneumococci were cultured and isolated on 5% sheep blood agar with 5mg/l gentamicin. *Haemophilus influenzae* and *Haemophilus parainfluenzae* strains were cultured on chocolate agar with 300mg/l bacitracin and 0.5units/ml penicillin. The antibiotic sensitivity pattern had been obtained using National Committee for Clinical Laboratory Standards (NCCLS) method, a disk diffusion test. Pneumococci were identified using optochin sensitivity and confirmed by bile solubility test. *Haemophilus influenzae* were identified using the *Staphylococcus aureus* streak method and confirmed by X and V paper disk method. During this confirmatory test it was found out that, among *Haemophilus* isolates that were positive by *Staphylococcus aureus* streak test, most were *H. parainfluenzae*, and not *Haemophilus influenzae*. Therefore, *Haemophilus parainfluenzae* strains found during the study too were subjected to antibiotic sensitivity tests.

The total number of *Streptococcus pneumoniae* carriers were 137/900 (15.22%). 34 of 900 (3.77%) children carried *Haemophilus influenzae* in their upper

respiratory tract. 101/900 (11.22%) were positive for *Haemophilus parainfluenzae* strains either in their throats or in their nasal passage. The study was carried out on children aged 0-15 years and in three distinctive groups namely infants (0-1 years) pre-school children (2-5 years) and school children (6-15 years). Most number of pneumococci were isolated from the pre-school group 63/240 (26.25%). Age was related to carrier rate of *Streptococcus pneumoniae*. ( $P=0.00000007$ ). Age had little effect on the *Haemophilus influenzae* and *Haemophilus parainfluenzae* carrier rates. Equal numbers of school girls and equal number of school boys were taken into account to find a relationship between sex and carrier rate. There wasn't any statistically significant relationship between the sex where pneumococci and *Haemophilus influenzae* were concerned ( $P=0.8994$  and  $P=0.8243$ ). But out of the *Haemophilus parainfluenzae* carriers 66.66% were school boys and 33.33% were school girls ( $P=0.0036774$ ). This difference is statistically significant. Sleeping condition had a statistically significant effect on the carrier rate of *Streptococcus pneumoniae* ( $P=0.000000045$ ). On comparing the sleeping conditions, bed and floor and their statistical values further, sleeping on floor was significantly associated with higher carriage of pneumococci. ( $P=0.0000001$ ). *Haemophilus influenzae* were isolated more frequently from the oropharyngeal site ( $P=0.0037189$ ). *Haemophilus parainfluenzae* were found from the oropharyngeal site in very high rates. The P value was less than 0.01, hence it is highly significant. In the case of pneumococci incidence of carriage in throat and nose was not significantly different.

Each organism was subjected to 6 different antibiotics. The results are as follows.

*Streptococcus pneumoniae* sensitivity to antibiotics.

Penicillin	89	(55.625%)
Erythromycin	128	(80%)
Chloramphenicol	138	(82.5%)
Tetracycline	106	(66.25%)
Co-trimoxazole	65	(40.625%)
Vancomycin	153	(95.625%)

*Haemophilus influenzae* sensitivity to antibiotics.

Ampicillin	27	(77.14%)
Cefotaxime	32	(91.42%)
Cefuroxime	31	(88.5%)
Chloramphenicol	28	(80%)
Ceftriaxone	33	(94.28%)
Co-trimoxazole	24	(68.57%)

*Haemophilus parainfluenzae* sensitivity to antibiotics.

Ampicillin	64	(60.37%)
Cefotaxime	94	(88.68%)
Cefuroxime	103	(97.17%)
Chloramphenicol	71	(66.98%)
Ceftriaxone	89	(81.13%)
Co-trimoxazole	72	(67.92%)

Among the infants studied only three carried *Streptococcus pneumoniae* in their nasal passage and all were sensitive to all the drugs. There were no Haemophilus carriers among the infants.