

ธรรมชาติของโรคหวัดในเด็กที่เข้ารับการเลี้ยงดูในสถานเลี้ยงเด็กกลางวันของโรงพยาบาลมหาวิทยาลัยในขอนแก่น

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Natural History of the Common cold with Respect to Day-care Attendance at a University Hospital in Khon Kaen, Thailand

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หลักการและวัตถุประสงค์: โรงพยาบาลศรีนครินทร์ ได้จัดตั้งสถานรับเลี้ยงเด็กกลางวันสำหรับเด็กวัยก่อนเรียนเพื่อเป็นสวัสดิการแก่บุตรหลานของบุคลากร แต่ผู้ปกครองส่วนหนึ่งพบว่าเด็กที่ถูกเลี้ยงในสถานเลี้ยงเด็กกลางวันป่วยด้วยโรคระบบหายใจบ่อยกว่าเด็กทั่วไป การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาอุบัติการณ์และธรรมชาติของโรคหวัดในเด็กที่รับการเลี้ยงดูในสถานรับเลี้ยงเด็กกลางวันของโรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น

วิธีการศึกษา: เป็นการติดตามอัตราการเกิดโรคหวัด โรคแทรกซ้อนและธรรมชาติของโรคหวัดในเด็กที่เข้ารับการเลี้ยงดูในสถานเลี้ยงเด็กกลางวัน ซึ่งผู้ปกครองเซ็นยินยอมเข้าร่วมการศึกษา จำนวน 90 คน เป็นเวลา 1 ปี 2 เดือน ตั้งแต่เดือนสิงหาคม 2546 ถึงตุลาคม 2547 โดยผู้ปกครองและพี่เลี้ยงเด็กจะเป็นผู้บันทึกอาการของโรคหวัดและอาการร่วมต่างๆ ในสมุดบันทึกประจำตัวเด็กแต่ละคนทุกวันตลอดระยะเวลาที่ศึกษา ผู้วิจัยจะตรวจสอบสมุดบันทึก และสัมภาษณ์ผู้ปกครองและพี่เลี้ยงทุก 2 สัปดาห์เพื่อให้ข้อมูลครบถ้วน

ผลการศึกษา: เด็กที่เข้าร่วมการศึกษาทั้งหมด 90 คน อายุระหว่าง 8-53 เดือน (เฉลี่ย 31 ± 0.9 เดือน) ป่วยเป็นหวัดเฉลี่ย 12 ครั้ง/คนปี เด็กจำนวนร้อยละ 77 เป็นหวัดมากกว่า 8 ครั้ง/ปี แต่แต่ละครั้งที่เป็นหวัดจะมีอาการเฉลี่ย 5 ± 5.4 วัน โรคแทรกซ้อนที่พบ คือ ไซนัสอักเสบร้อยละ 12 และหูชั้นกลางอักเสบร้อยละ 0.1 พบอุบัติการณ์สูงในฤดูหนาวระหว่าง

Background and Objective: Srinagarind Hospital set up a pre-school day-care center to support working parents in the campus. However, some parents personally complained of frequent respiratory illnesses among their children attending day-care. This study was conducted to determine the incidence and natural history of common cold among children attending Srinagarind Hospital Day-Care Center, Khon Kaen University.

Methods: This was a one-year cohort comprising 90 children (with parental consent) assessed between August 2003 and October 2004. All of the respiratory symptoms and interventions of each child were recorded daily by day-care workers and parents on the weekends. The investigators checked for missing data every 2 weeks.

Results: The enrolled children, between 8 and 53 months of age (mean \pm SD; 31 ± 0.9 months), suffered an average 12 colds per person-year. The majority (77%) had more than 8 episodes per year. The mean duration of each episode was 5 days (SD=5.4). Complications included sinusitis (12%) and otitis media (0.1%). The number of children with common colds peaked during the cold season (between November and February). The rate of inappropriate antibiotic therapy was 6%. 'Being under 2 years of age' was the primary risk factor for getting frequent colds (more than 8 per year; Odds ratio, 95%

เดือนพฤศจิกายน ถึงกุมภาพันธ์ พบอัตราการรักษาด้วยยาปฏิชีวนะที่ไม่เหมาะสมร้อยละ 6 การเข้าอยู่ในสถานเลี้ยงเด็กอายุน้อยกว่า 2 ปี คือ ปัจจัยเสี่ยงที่สำคัญที่สุดของการเป็นหวัดบ่อยๆ มากกว่า 8 ครั้ง/คนปี (Odds ratio, 95% confidence interval; 12, 1.53-95.6)

สรุป: เด็กที่เข้ารับการเลี้ยงดูในสถานเลี้ยงเด็กกลางวันมีอุบัติการณ์การเป็นหวัดค่อนข้างสูง อาการส่วนใหญ่หายภายใน 1 สัปดาห์ พบโรคแทรกซ้อนที่สำคัญคือ ไซนัสอักเสบ ปัจจัยเสี่ยงที่สำคัญของการเกิดโรคหวัดบ่อย คือ การเข้ารับการเลี้ยงดูตั้งแต่อายุน้อยกว่า 2 ปี

confidence interval; 12, 1.53-95.6).

Conclusions: This study demonstrates an increased frequency of upper respiratory tract infections among children attending a day-care center. Simple common colds are usually self-limiting and usually last not more than one week. The most common complication was sinusitis. Children attending day-care before their second birthday are at significant risk of getting frequent colds.

Keywords: common cold, day-care attendance, natural history

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Introduction

Viral upper respiratory tract infection is the most common illness among young children. Although the disease itself produces mild symptoms and is self-limiting, it can cause more serious complications such as bacterial sinusitis, otitis media or even pneumonia. Young children suffer approximately 3-8 colds per year^{1,2}; some may have as many as 12 per year, particularly those attending day-care centers.^{3,4} Colds are reportedly the leading cause of school absences among children and work absences by their parents.⁵ Colds are also an important cause for increasing multi-antibiotic resistant organisms because of overuse of antibiotics.⁶

During the past decade, there has been an increasing proportion of mothers of young children entering the workforce and consequently, a larger proportion of children attending day-care. To support working parents, a day-care was set up at our hospital campus to care for small children before their being of school age. Many parents personally complained to our day care representatives of frequent respiratory illnesses among their children attending day-care. To investigate this complaint and to find ways to improve our day-care service, we conducted a study to determine the incidence, natural history, risk factors, complications and prescriptions of antibiotics for acute respiratory tract infection among day-care attendees.

Materials and methods

This was a one-year prospective cohort study of children attending our day-care between August 2003 and October

2004. We excluded children with any congenital anomalies or immunodeficiency. The study was reviewed and approved by The Khon Kaen University Ethics Committee for Human Research and only children with informed, written parental consent were enrolled. Every child had a personal daily one-year record comprising: (1) personal history (viz., history of birth, age, sex, family members, feeding history, family's pets, duration of day-care attendance); (2) daily record of respiratory infection symptoms (i.e., fever, nasal discharge, cough, ear discharge); and, (3) antibiotic treatment. Day-care workers and parents recorded all data. Every 2-4 weeks, the investigators checked all records for any missing data. The history of all of the illnesses was checked against the hospital records at Srinagarind Hospital, Khon Kaen University, Thailand.

A common cold or simple URI was defined as 'the presence of nasal discharge, cough with or without fever which resolved within 2 weeks'⁷. Symptoms that lasted more than 14 days were defined as suspected of 'sinusitis'⁷. Otitis media was labeled only in the child who was diagnosed by a doctor shown in the hospital records. An illness was counted as a new episode when the symptoms occurred at least 3 days after the resolution of the previous episode.

Statistical analysis

Descriptive statistics were used as the baseline data. The Chi square and Fisher's exact tests were used for comparisons as appropriate (p<0.05). Logistic regression and multivariate analysis were used for risk factors analyses.

Results

Our day-care center raises children age between 6 months to 4 years, separates into 3 levels; level 1 aged under 2 years, level 2 aged between 2-3 years and level 3 aged over 3 years. Each level, the children are raised in the rooms with mean space around 2 square meter/child. The ratios of baby sister to children are 1: 4-5, 1: 8-9 and 1: 12-14 in the level 1, 2 and 3 respectively. During study period, 138 children were attending the day-care and of those 90 (65%) were enrolled, including 47 males (52.2%). The children were between 8 and 53 months of age (mean 31±0.9 months). Sixty percent of all the children received a 4-month period of exclusive breastfeeding. Atopic history among the parents was found (38%), while 29% of all children were passive smokers. The mean duration of day-care attendance before enrolment was 11±9.2 months (Table 1).

During the study period, every child suffered at least one cold. A total of 1,100 colds was counted. The incidence was 3 to 25 colds/child/year (mean, 12±5.4; median, 12). The duration of each cold was 1 to 26 days (mean 5±1.9; median, 4). Incidence peaked in the cool season between November and February.

Table 1 Baseline demographic data of the children

Characteristic	N (%)
Sex, male	47 (52.2)
Age, range, month	8 - 53
- Mean (SD)	31 (0.9)
Age at first attendance, range, month	1 - 41
- Mean (SD), month	20 (9.6)
- Age ≤24 months	27 (30)
Birth weight, range, g	2,270 - 4,150
- Mean (SD)	3,057 (337)
Exclusive breastfeeding in the first 4 months	54 (60)
- Mean duration of breastfeeding (SD)	20 (18.6)
≥2 children in household	71 (78.9)
History of self atopy	14 (15.6)
History of parental atopy	34 (37.8)
History of passive smoking	26 (28.9)
Pet in household	25 (27.8)
Duration of day-care attendance before enrollment, mean (SD), month	11 (9.2)

Only one episode of otitis media was found (0.1%); however, 131 episodes (11.9%) of sinusitis were suspected in 41 children (45.6%). No other complications were found. There were 57 episodes (5.9%) of antibiotics (mostly amoxicillin) being inappropriately prescribed for simple common cold. Of the 131 episodes of sinusitis, antibiotics were prescribed for only 13 episodes, while the remaining 118 episodes were self-limiting, perhaps because they were caused by viral infections or were the result of allergic rhinitis symptoms.

Although every child suffered from a cold in the one-year period, the primary risk factor for frequent colds (*i.e.*, over 8 colds/year) was 'attending day-care before being 2 years of age' (odds ratio of 11; 95%confidence interval, 1.4-89.7; *p* = 0.02). All of the other risk factors, such as allergy, pets and number of children per family, passive smoking, and duration of day-care attendance, were not statistically significant (Table 2).

Discussion

This study demonstrated that every child attending our day-care experienced at least one cold episode each year, while 76.7% of them had more than 8 colds/year. The incidence was 12±5.4 colds/child/year. The mean duration of each cold was 5±1.9 days. Otitis media and sinusitis were found in 0.1% and 11.9%, respectively. Children who attended day-care before their 2nd birthday had the greatest risk of getting frequent colds (more than 8 colds/year) than the older children in the study.

The incidence of getting a cold in this study was similar to previous studies but the incidence of complications, such as otitis media and sinusitis, was different.⁷⁻⁹ Our study found otitis media in only 1% of participants compared to the 17-32% found in other studies, perhaps because the definition of otitis media used in our study required a doctor's diagnosis. Moreover, although daily records concerning respiratory symptoms were obtained, no attempt was made to get an ear examination for all of the children with colds; therefore, some children who developed mild ear symptoms might have been missed and/or might have had spontaneous resolution without any treatment, resulting in the lower incidence.

We found 11.9% of children had respiratory symptoms which lasted more than 14 days and defined this as sinusitis.

Table 2 Risk factors of frequent colds/year*

Factors	Univariate		Multivariate	
	Odds	95%CI	Odds	95%CI
Age at attending <2 years	12	1.53 - 95.6	11	1.37 - 89.7
Duration in day-care >1 year	2	0.77 - 5.5	1.47	0.51 - 4.23
History of atopy	1.7	0.59 - 4.93	1.75	0.57 - 5.43
≥2 children in household	1.2	0.77 - 5.58		
History of passive smoking	1.02	0.34 - 3.0		
Pet in household	1.3	0.42 - 4.05		
Breast feeding >4 months	1.9	0.18 - 1.5		

*frequent colds/year ≥8 colds/year

This figure is similar to previous studies, where 5 to 13% of children who suffered from viral upper respiratory tract infection might be complicated by secondary bacterial infection of paranasal sinuses.^{7,10-11} This high incidence, however, was due to: (1) a diagnosis using clinical symptoms such as prolonged nasal discharge of more than 14 days without physical examination or other definitive confirmations; even though (2) such symptoms might be difficult to distinguish from allergic rhinitis. Interestingly, although 60% of all of the children in our study had 4 months of exclusively breastfeeding, 38% had parental atopic history that might have caused a high incidence of allergy in these children.

Our study confirmed the finding in previous studies regarding the duration of the simple common cold of no longer than 7 days.⁷ Most colds were self-limiting and the incidence of antibiotic overuse quite low (5.9%) compared to the 23.6% reported by the Thai Ministry of Public Health¹² and the 60 to 71% reported elsewhere.¹³⁻¹⁴ Most of the parents of the children attending our day-care are healthcare workers, which may account for the lower incidence of antibiotic overuse; nonetheless, some children were still getting inappropriate antibiotic treatment, exacerbating antibiotic resistance among microorganisms.

The limitation of this study were 1) the results came from the daily personal records which might have some missing data, and 2) all the children did not underwent physical examinations for the definite diagnosis.

The two critical factors involved in the transmission and development of infectious diseases in the day-care are the

hosts (personal immunologic factors) and environmental factors (personal hygiene and the potential for sharing respiratory secretions).¹⁵ The significant risk factor we found for frequent colds (*i.e.*, >8 colds/year) in this study was ‘attending day-care by children under 2 years of age’. The other factors such as allergy, pets and number of child per family, passive smoking, and duration of day-care attendance had no statistical significance. Previous studies also showed that young children attending day-care had a higher risk of recurrent ear infections,¹⁶⁻¹⁷ but we only examined the host factors associated with frequent infections in order to improve the day-care. Further study of the environmental factors should be done.

Conclusion

This study demonstrated an increased frequency of upper respiratory tract infections among children attending a university hospital day-care. The most common complications was sinusitis although simple common colds are usually self-limited, usually lasting not more than one week. Children attending day-care before their second birthday was the significant risk factor for getting frequent colds.

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