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Original Research Paper

Incidence and Pattern of wheezing among neonates in Al -marej city

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ABSTRACT:
Introduction: Wheezing is a high pitched, whistling sound that occurs when smaller airways are narrowed by presence of either bronchospasm, swelling of mucosal lining, excessive amount of secretions. It is heard mostly on expiration. And Manifestation of lower respiratory tract. **Objective:** To determine incidence and pattern of wheezing among neonatal age group in Almarj city. **Methods**: Descriptive study (longitudinal study) was done in two groups of patients for a period of one year. One group carried among neonates who are visited pediatric outpatient clinic, where neonates and parents are involved. The other group, data was collected from clinical records of neonates admitted to neonatal unit were reviewed. **Results**: The total number of neonates included in our study about 711.540 of them were Admitted to hospital, about 18 cases (3.3%) only were admitted with wheeze. - and a total 171 neonates were visited pediatric outpatient clinic, 51 cases about 29.8% were presented with wheeze. **Conclusion**: Formula feeding, Infantile eczema, symptoms of GERD and maternal asthma associated with wheeze episode. Incense burning, indoor mold and smoking in the home exposure are common triggers of wheezing in neonates.

Keywords: wheezing, incidence, pattern, neonates,Al marj.

INTRODUCTION:

Wheezing is a high pitched, whistling sound that occurs when smaller airways are narrowed by presence of either bronchospasm, swelling of mucosal lining, excessive amount of secretions. It is heard mostly on expiration. And Manifestation of lower respiratory tract [(1)]. During the first month of life pulmonary diseases can be clinically manifest as wheezing.

Etiological factors of wheezing: -Viral infection: The viruses play an important role in wheezing episodes which may mark the beginning of asthma and may cause pneumonia, which have the greatest risk of death in neonates [(2)]. Choking: -Neonates don't have a head control or strength to move away from flow of milk. Milk has entered their airways causing cough, wheezing or pneumonia [(3)]. Gastro esophageal reflux disease: This is a condition in which small amount of fluid can then be breathed into the lungs or may not breathed into lungs but trigger vagal or neural reflux causing airway reactivity [(4)]. Broncho pulmonary dysplasia: BPD is caused by damage to tissue of the lungs [(5)]. Cardio vascular causes of wheezing: may be related to cardiomegaly, left atrial enlargement and dilated pulmonary arteries pulmonary oedema [(6).] Wheezing sometimes is an indicator of asthma. Cow's milk protein allergy (CPMA): about 20-30% infants with CMPA develop respiratory symptoms [(7)]. Persistent wheeze from birth: suggests baby may have been born with congenital anomaly as cleft palate, laryngeal cleft, tracheoesophageal fistula, esophageal atresia, bronchial stenosis and bronchomalacia [(8)]. External vascular compression: includes a vascular ring, in which the trachea and esophagus are surrounded completely by vascular structures, or a vascular sling [(9)].

Symptoms of wheezing occurring in children before age 3 years, even transient symptoms, are found to lead to a persistent reduction in lung function by age 6 years [(10)], and some of these children eventually develop asthma [(11).]

Approximately 40–50% of infants have at least one wheezing episode in their first year of life, and these episodes are frequently repeated thereafter [(12).]

A recurrent wheeze is estimated to occur in one-third of children of preschool age and can cause significant morbidity, decrease quality of life, and increase the frequency of the use of health care services and economic costs [(13).]

Additionally, different factors, including genetic, environmental, and host factors (and interactions among these factors), can impact a child's condition and contribute to the development of wheezing and the progression of a patient's symptoms [(14).]

The wheezing may represent a progressive respiratory problem, early diagnosis and treatment may prevent additional respiratory pathology and sequelae. Wheezing during the first month of life might be associated with later asthma, especially when episode is severed and / or frequent [14].Time to the first episode of wheeze has been associated with the frequency of recurrence: the earlier the first episode occurs, the more frequently wheezing occurs [15].It is possible that some environmental factors could influence the innate immune response during the first month of life, a critical period for immune system development, resulting in more frequent and sever episode of wheezing [16].Detailed history laying on family, asthma in a first degree relative, family history of immune deficiency, contact with respiratory tract infection, social history should include an environmental history including any smoker at home, number of sibling and home environment e,g dust, mites, incense, heating and cooling techniques, and mold [17].

On physical examination, evaluation of the baby's vital signs with especial attention to the respiratory rate and pulse oximetry reading for oxygen saturation is an important initial step, listening to breath sounds and also useful to evaluate the skin of the baby for eczema [18].

Treatment of neonates with wheezing depends on the underlying etiology.

neonates with acute bronchiolitis who are respiratory distress should be hospitalized; the main stay of treatment is supportive if hypoxemic should receive cool humidified oxygen and nasal washing [19].Use of ipratropium bromide is acceptable, is also useful in babies with significant tracheal and bronchomalacia [20].Azithromycin (AZM) is macrolide antibiotic Known for its immuno modulating and anti-inflammatory properties [21].Ribavirin, an antiviral agent administered by aerosol, has been used for RSV bronchiolitis in neonate with congenital heart disease [22].

Aim of the study: To determine incidence and pattern of wheezing among neonatal age group in Almarj city.

Patient and method:

Study design and duration: Descriptive study (longitudinal study) was done in two groups of patients for a period of one year.

Study area: - One group carried among neonates who are visited pediatric outpatient clinic, where neonates and parents are involved. The clinic was chosen by simple random sample and participants by Convenient sample.

The other group data was collected from clinical records of neonates admitted to neonatal unit were reviewed

Tool of the study: Data were collected by using semi-structured questionnaire from parents. It covered the following items:

Date of presentation, neonate's age - sex, mother's age, education, job, history of chocking, oil ingestion, recurrent vomiting, respiratory tract infection contact, using of powder, incense, perfumes and exposure to smoking, mode of delivery, use of CPAP, Mechanical Ventilation and for how long, Maturity, feeding, H/O Consanguinity and the study can inform decisions regarding treatment and risk prevention, as well as the planning of public health measures.

Pilot study: A pilot study was conducted to check for difficulties in the questionnaire that may arise during final data collection. Necessary modifications were applied before final data collection.

Ethical consideration: The necessary official permissions from different authorities were obtained before the conduction of the study. Informed consent to participate in the study was obtained from respondents. Confidentiality of the data was assured.

Statistical analysis: Data entry and management processes (cleaning, recoding, analysis) was done using Statistical Package for Social Science (SPSS Inc., Chicago, IL, USA). Descriptive statistics were done using frequency and percentage. The dependent variable was wheezing (presence or absence of wheezing) and the independent variables were various socio-demographic variables.

RESULTS:

Table (1): distribution of neonates by wheezing, Al marj, 2024

	NO	wheezy	percent
hospital	540	18	26.1 %
OPD	171	51	73.9 %
Total	711	69	100 %

Table (1) shows that a total 540 neonates were admitted to the hospital, 18 cases only were admitted with wheeze and a total 171 neonates were visited pediatric outpatient clinic, 51 cases were presented with wheeze.

Figure (1): - distribution of neonates by age first episode of wheeze, Al marj, 2024

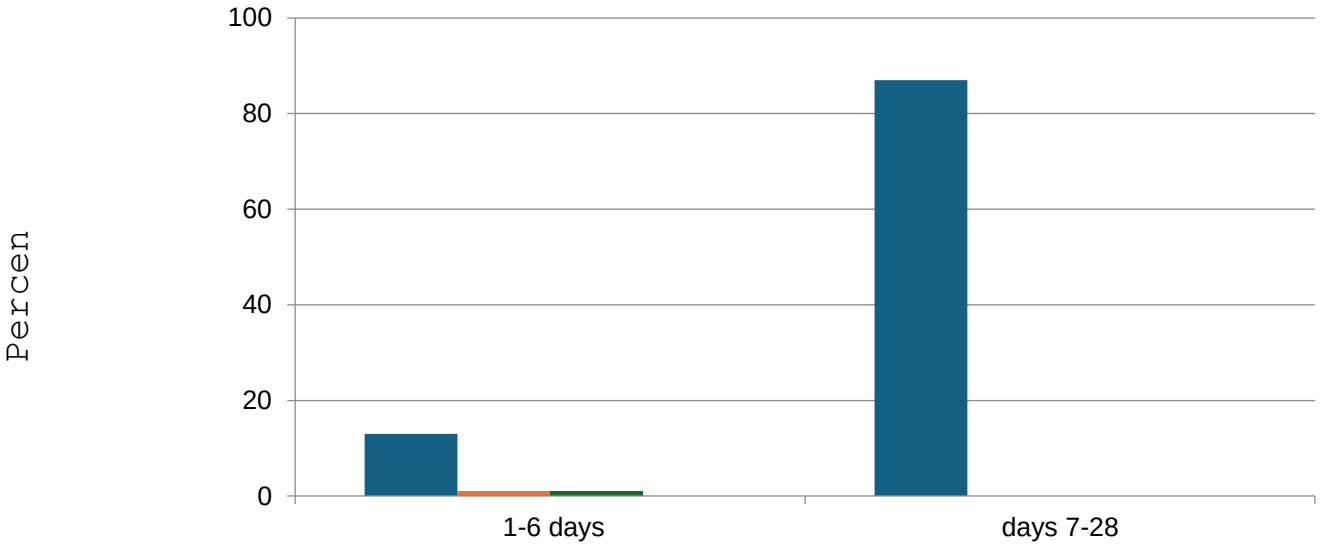

Fig. (1) shows that most of neonates (87.0) had first episode of wheeze peaks at late neonatal period (7-28 days)

Figure (2): - distribution of neonates by sex, Al marj,2024

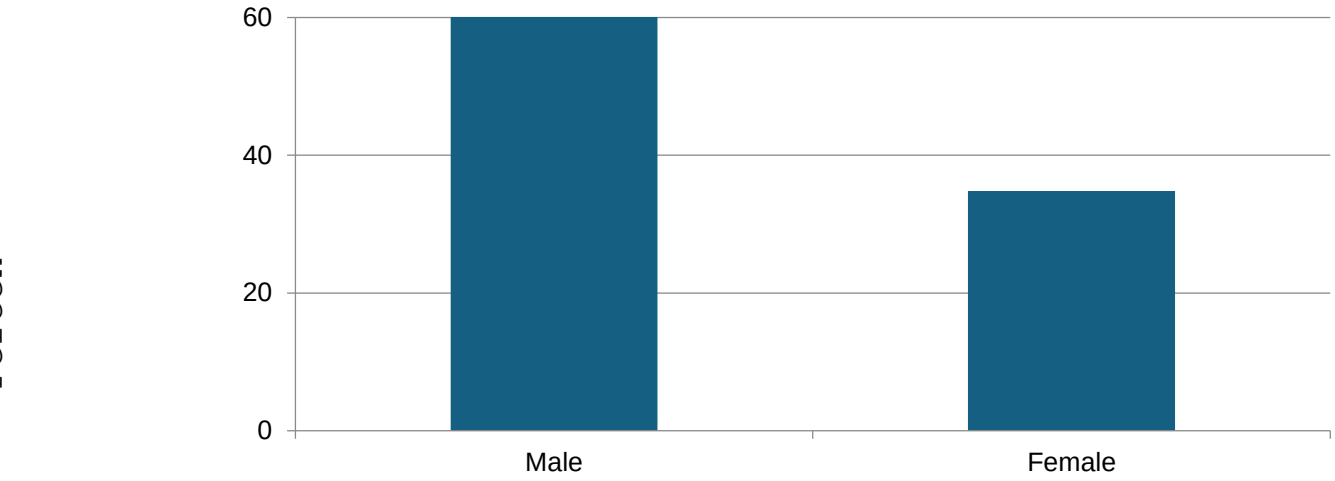

Fig. (2) displays that Male to female ratio, Incidence of wheezing higher among male neonates 65.2% compared to female

Figure (3): - Distribution of wheezing in neonates by months**, Al marj, 2024**

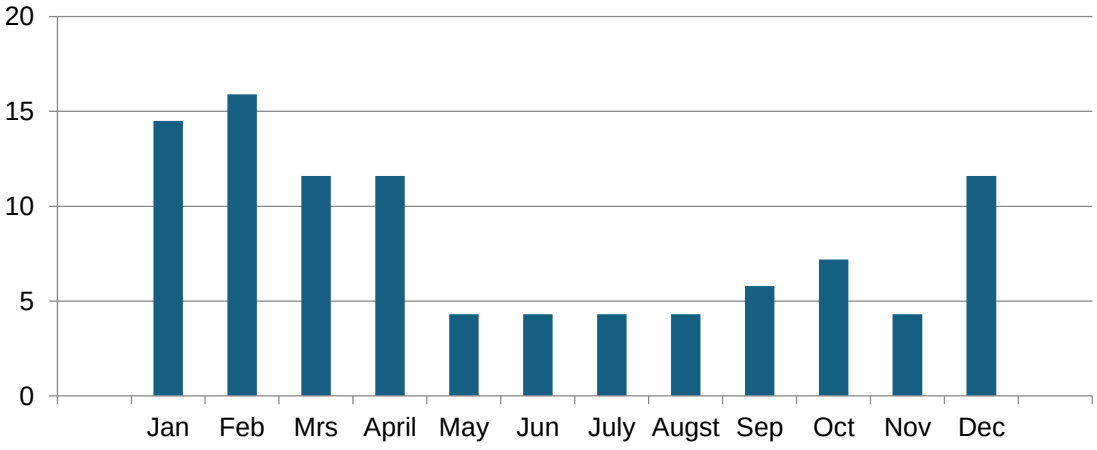

Fig. (3) displays that the incidence of wheeze was significantly higher between December and April.

Table (2): distribution of neonates by Maternal age and occupation in relation to wheezing, Al marj,2024

Variables	Frequency	Percent
Maternal age		
less than 20	19	27.5
20-25	15	21.7
25-30	17	24.6
30-35	6	8.7
35-40	3	4.3
more than 40	9	13.0
Maternal occupation		
House wife	35	50.7
Teacher	21	30.4
Others	13	18.8
Total	69	100.0

Table (2) displays that percentage of wheezing higher among mothers less than 20 years and 50.7% of cases their mother were house wife.

Table (3): distribution of neonates by associated risk factors in relation to wheezing, Al marj,2024

Variables	Frequency	percent
Maternal asthma		
Present	26	37.7
No	43	62.3
GERD		
Percent	11	15.9
No	58	84.1
Eczema		
Percent	12	17.4
No	57	82.6
Breast feeding		
Exclusive breast feeding	15	21.7
formula feeding	54	78.3
Total	69	100.0

Table (3) displays that 37.7% of cases their mothers had asthma, 15.9% of cases had GERD symptoms while 17.4% of cases had eczema. On the other hand, highest wheezing percentage were observed among formula feeding

Table (4): distribution of neonates by present history in relation to wheezing, Al marj,2024

Present history	frequency	Percent
Cough	69	100
nasal obstruction	64	92.8
Breathlessness	68	98.6
Fever	18	26
O.L ingestion	8	11.6
Chocking	11	15.9
Vomiting	9	13.0
recurrent vomiting	14	20.3
Diarrhea	4	5.8
RTI symptoms	50	72.5
skin rash	11	15.9
exposure to smoking	6	8.7
exposure to incense	22	31.9
presence of house mold	10	14.5
exposure to powder	5	7.2
Total	69	100.0

Table (4) displays that all cases represented with Cough while 98.6 % and 26% represented with Breathlessness and fever respectively. On the other hand ,72.5% of cases presented with RTI symptoms and 31.9 % present with history of exposure to incense.

DISCUSSION:

The total number of neonates included in our study about 711. 540 of them were Admitted to hospital, about 18 cases (3.3%) only were admitted with wheeze and a total 171 neonates were visited pediatric outpatient clinic, 51 cases about 29.8% were presented with wheeze. That is means the wheezing in neonates it is 'not usually a serious sign, so the first thing to do is to work out what is wrong.

The mean monthly incidence rates of wheezing in the first 36 months of life were 27.84 episodes per 1000 children [23]. This result revealed that incidence of wheeze was significantly higher between December and April. This finding
agrees with study in a northern Spanish [23].

The same finding recorded by other studies [24,25]. Furthermore, environmental factors such as tobacco smoke, air pollution, molds and fungi, indoor chemicals, and household factors have an important impact on wheezing disorder [26].

Ying-Lunetal.,2021 revealed that allergic rhinitis and re-hospitalization for respiratory tract infections were two significant risk factors for preschool wheezing/asthma in premature neonate [23]. Recurrent wheezing during preschool childhood is associated with poorer lung function and higher airway resistance which suggests increased asthma susceptibility [26].

According to the present results exclusive breast feeding might be a good strategy for delaying the first wheeze episode the same recorded by study in Latin America [27].

Breast milk might be protective due to it is anti-infective micro biome - modulating and immune - stimulatory properties [28]. All of the factors present in human are able to reduce the risk of asthma and wheezing in later childhood by directly promoting the development of the infant's immune system [29].

Possible risk factor for wheezing in neonates and maternal occupation don't seem to be a substantial risk factor for wheezing but maternal education affects the neonatal health were about 50.7% of cases house wife, may be linked to Limited access to health Information, this led to greater exposure to health damaging risk factors for the mother and consequently their baby.

In China study where about 56.3% of wheezy neonates diagnosed with viral Infection and about 26% In Indian study were diagnosed as viral infection and eczema, and in sousse, Tunisia hospital about 47.3% presented in cold months. therefore, trying to avoid respiratory infection during the first month of life maybe of special important in those neonates with family history of atopy, history of exposure in Incense and smoking were about 31.9-8.7% respectively. Our studies agreement with that showed that several maternal factors increase the prevalence of childhood asthma in pre-school age. Suitable and effective health policies and strategies should be taken into account to confront the predominant maternal factors that increase its prevalence in pre-school age[30].

The burning of Arabian incense is common practice in Al marj city and is an important trigger of wheezing exposure to cigarette smoking can increase the develop of wheezing in neonates. Children exposed to tobacco smoke have an increased risk of developing wheezing syndrome.This risk increases in association with the number of cigarettes smoked inside the house and the presence of other allergic components in the family[31].

In our study the relation between GERD and wheeze in neonates about 15.9% that means wheezing might have directly contributed to GERD etiology.

the association between eczema and wheeze in our study about 17.4% in compare with Indian study were about 26% of babies diagnosed with viral infection and eczema, the studies suggest not every neonate with wheeze has eczema, but there's Link between eczema and developing of wheeze in neonatal age group. Our study agreement[32] that conclusion that Recurrent respiratory tract infections with symptoms resistant to treatment should be considered a reason to investigate for gastroesophageal reflux, because the symptoms may be due to micro- or macro-aspiration of the gastric refluxate or to an esophageal-bronchial reflex mediated through the vagal nerve.

CONCLUSION:

Wheezing in neonates can be distressing for parents but in most cases, symptoms can be relieved at home. The main factor for the first wheeze episode in neonates is having cold symptoms. Formula feeding, Infantile eczema, symptoms of GERD and maternal asthma associated with wheeze episode. Incense burning, indoor mold and smoking in the home exposure are common triggers of wheezing in neonates.

Recommendation: The implementation of smoking limits and prohibition is crucial in areas that are frequented or utilized by children. Encourage breast feeding. Avoid exposure to house mold, powder, incense.

REFERENCES:

1. Horak E. wheezing in infants and toddlers: new insights. Wien klin Wochenschr. 2004;4(1- 2):15-20. doi: 10.1007/BF03040418. [PubMed] [CrossRef] [Google Scholar].

2. Mallol J., García-Marcos L., Solé D., Brand P., EISL Study Group intrnational prevalence of recurrent wheezing during the first year of life: variability, treatment patterns and use of health resources. Thorax. 2010;65(11):1004-1009. [PubMed] [Google scholar].
3. Infant choking while breastfeeding; New Kids-center
4. Canning BJ, Mazzone SB: Reflex mechanisms in gastroesophageal reflux disease and asthma. Am J Med. 2003, 115 (suppl 3A): 45S-48S.
5. O'Brodovich HM, Mellins RB (1985) Bronchopulmonary dysplasia. Unresolved neonatal acute lung injury. Am Rev Respir Dis 132:694-709.
6. Kussman BD, Geva T, McGowan FX. Cardiovascular causes of airway compression. Paeditar Anaeth. 2004;4(1):60-74. [PubMed] [Google Scholar]. neonatal acute lung injury. Am Rev Respir Dis 132:694-709.
7. Host A. cow's milk protein allergy and intolerance in infancy some clinical, epidemiological aspect peddiatic Allergy immunol 1994;5:1
8. Zach M, Eber Adult outcome of congenital lower respiratory tract malformations. Thorax. 2001;4(1):65-72. Doi: 10.1136/thorax.56.1.65. [PMC free article] [PubMed] [CrossRef] [Google Scholar].[
9. Hofhuis W, van der Wiel EC, Tiddens HA, Brinkhorst G, Holland WP, de Jongste JC. Etal. Bronchodilation in infants with malacia or recurrent wheeze. Arch Dis Child. 2003;4(3):246-249. doi: 10.1136/adc.88.3.246. [PMC free article] [PubMed] [CrossRef] [Google Scholar].
10. Martinez, F.D.; Wright, A.L.; Taussig, L.M.; Holberg, C.J.; Halonen, M.; Morgan, W.J. Asthma and wheezing in the first six years of life. The Group Health Medical Associates. N. Engl. J. Med. 1995, 332, 133–138. [CrossRef] [PubMed]
11. Padem, N.; Glick Robison, R. The infant and toddler with wheezing. Allergy Asthma Proc. 2019, 40, 393–395. [CrossRef] [PubMed]
12. J MallolL García-MarcosD Solé. International prevalence of recurrent wheezing during the first year of life: variability, treatment patterns and use of health resources. Thorax 2010; 65: 1004–1009.
13. Savenije O.E., Granell R., Caudri D., Koppelman G.H., Smit H.A., Wijga A. Comparison of childhood wheezing phenotypes in 2 birth cohorts: ALSPAC and PIAMA. J Allergy Clin Immunol. 2011;127(6):1505–1512. doi: 10.1016/j.jaci.2011.02.002. [DOI] [PubMed] [Google Scholar]
14. Thomes, A.O, Lemanske, D.J infections and their role in childhood asthma inception pediatr. Allergy immune l. 25,122-128 (2014).
15. Bouzas, M.L.et al Wheezing in infants' frequency, clinical characterisrics and treatment. J. Pediatr (Rio) 88,361-365 (2012).
16. Babu, K.S and Arshad, S.H. the role of allergy in the development of airway inflammation in children. Paediatr. Respir, Rev. 4,40-46 (2003).
17. SilvestriM, Sabatini F, Defilippi AC, Rossi GA. The wheezy infant-immunological and molecular considerations. Paediatr respir Rev..
18. Hofhuis W, van der Wiel EC, Tiddens HA, Brinkhorst G, Holland WP, de Jongste JC. Etal. Bronchodilation in infants with malacia or recurrent wheeze. Arch Dis Child. 2003;4(3):246-249. doi: 10.1136/adc.88.3.246. [PMC free article] [PubMed] [CrossRef] [Google Scholar].
19. Joseph L, Goldberg S, Picard E. A randomized trial of home oxygen therapy from the emergency department for acute bronchiolitis. Pediatrics. 2006;4(3): 1319-1320. doi: 10.1542/peds.2006-1287. [PubMed] [CrossRef] [Google Scholar].
20. Bush A. Treatment options of asthma in infancy. Pediatr Pulmonol].Google Scholar[Suppl. 2004;4:20-22. [PubMed]
21. Kadota J, Sakito 0, Kohno S, Sawa H, Mukae H, Oda H, Kawakami K, Fukushima K, Hirtani K, Hara K 1993 A mechanism of erythromycin treatment in patients with diffuse panbronchiolitis. Am Rev Respir Dis 147: 153- 159
22. King VJ, Viswanathan M, Bordley WC, Jackman
AM, Sutton SF, Lohr KN, Carey TS. Pharmacologic treatment of bronchiolitis in infants and children: a systematic review. Arch PediatrAdolesc Med. 2004;4(2):127-137. doi: 10.1001/archpedi. 158.2.12 [CrossRef] [Google Scholar] [PubMed].
23. Early patterns of wheezing in asthmatic and non-asthmatic children European Respiratory Journal 2013 42(4): 1020-1028; DOI: https://doi.org/10.1183/09031936.00148712
24. Rodney Mudau, Kuku Voyi and Joyce Shirinde. Prevalence of Wheezing and Its Association with Environmental Tobacco Smoke Exposure among Rural and Urban Preschool Children in Mpumalanga Province, South Africa Int. J. Environ. Res. Public Health 2024, 21, 469.
25. Dávid Molnár, Gabriella Gálffy, Alpár Horváth, Gábor Tomisa, Gábor Katona, Andor Hirschberg, Györgyi Mezei and Monika Sultész . Prevalence of Asthma and Its Associating Environmental Factors among 6–12-Year-Old

Schoolchildren in a Metropolitan Environment-A Cross-Sectional, Questionnaire-Based Study. Int. J. Environ. Res. Public Health 2021, 18, 13403. https://doi.org/10.3390/ijerph182413403.
26. Ying-Lun Hsu, Hsin-Chun Huang, Ting-Yu Su and I-Lun Chen. Early Life Factors Associated with Preschool Wheezing in Preterm Infants. Children 2021, 8, 732. https://doi.org/10.3390/children8090732.
27. Rosa M Pacheco-Gonzalez , Javier Mallol , Dirceu Solé , Paul L P Brand , Virginia Perez-Fernandez , Manuel Sanchez-Solis , Luis Garcia-Marcos ; EISL Study Group. . Factors associated with the time to the first wheezing episode in infants: a cross-sectional study from the International Study of Wheezing in Infants (EISL). DOI: 10.1038/npjpcrm.2015.77
28. Oddy, W.H. A Review of the Effects of Breastfeeding on Respiratory Infections, Atopy, and Childhood Asthma. J. Asthma 2004, 41, 605–621. [CrossRef].
29. Triasih, R.; Setyowireni, D.; Nurani, N.; Setyati, A. Prevalence, Management, and Risk Factors of Asthma Among School-Age Children in Yogyakarta, Indonesia. J. Asthma Allergy 2023, 16, 23–32. [CrossRef]
30. Dimitrios Papandreou , Eleni Pavlidou , Stefanos Tyrovolas, Maria Mantzorou, Eleni Andreou ,Evmorfia Psara, Georgios Antasouras, Georgios K. Vasios, Efthymios Poulios and Constantinos Giaginis.(2023): Relation of Maternal Pre-Pregnancy Factors and Childhood Asthma: A Cross-Sectional Survey in Pre-School Children Aged 2–5 Years Old, Medicina, 59, 179.
31.Claudio Schvartsman, Sylvia Costa Lima Farhat, Samuel Schvartsman, Paulo Hilario Nascimento Saldiva.(2013): Parental smoking patterns and their association with wheezing in children . clinical science ;68(7):934-939
32. Vasile Valeriu Lupu, Gabriela Stefanescu, Ana Maria Laura Buga, Lorenza Forna , Elena Tarca,Iuliana Magdalena Starcea, Cristina Maria Mihai , Laura Florescu, Andrei Tudor Cernomaz ,Adriana Mocanu, Viorel Tarca, Aye Aung Thet 8 and Ancuta Lupu (2023):Is There a Potential Link between Gastroesophageal Reflux Disease and Recurrent Respiratory Tract Infections in Children? Diagnostics 13, 2310.