

Association between Parental Smoking and Pneumonia among Children Less Than 5 Years of Age

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ABSTRACT

Introduction: Pneumonia continues to be the biggest killer worldwide of children under five years of age. Although the implementation of safe, effective and affordable interventions has reduced pneumonia.

Objective: The objective of this study was to find association between parental smoking and pneumonia in children under 5 years of age presenting to tertiary care hospitals in Peshawar city, Pakistan.

Methodology: It was Unmatched Case Control Study with a ratio of 1:1. Cases were children less than five years of age presenting to four major tertiary care hospitals with Pneumonia infection. Controls were selected from same hospital with medical condition other than respiratory infection.

Results: Among the total sample of 248 children, 67 (27%) of the children's parents were smokers while 181 (83%) were not smoking. Pneumonia infections were twice likely to develop among those children who were exposed to parental smoking at home with an odd ratio of 2.02 (95% C: 1.14-3.60)

Conclusion: Children exposed to second hand smoking are at

high risk of developing respiratory problems like asthma later in life. More effective policies and strategies are required to limit the second hand smoking exposure at homes.

Keywords: Parental Smoking, Pneumonia, Children, Asthma.

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Article History:

Received: 07-12-2019, Revised: 05-01-2020, Accepted: 30-01-2020

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2020.6.1.030	

INTRODUCTION

Pneumonia is swelling (inflammation) of the tissue in one or both lungs.¹ Pneumonia continues to be the biggest killer worldwide of children under five years of age.² Mortality from 4 million in 1981 to just over one million in 2013 pneumonia still accounts for nearly one-fifth of childhood deaths worldwide.³

Pneumonia is caused by a variety of germs (viruses, bacteria, fungi, and parasites). Most cases, though, are caused by viruses. These include adenoviruses, rhinovirus, influenza virus, respiratory syncytial virus (RSV) and para influenza virus.⁴

Viral pneumonia tends to develop slowly over a number of days, whereas bacterial pneumonia usually develops quickly, often over a day. In children, symptoms may be less specific and they may not show clear signs of a chest infection.⁵ They may also have noisy or rattly breathing, have difficulty with feeding and make a grunting sound with breathing.⁵

It is the leading cause of death among children in low-income countries.¹ Many of these deaths occur in the newborn period.¹ The World Health Organization estimates that one in three newborn infant deaths are due to pneumonia.²

Approximately half of these cases and deaths are theoretically preventable, being caused by the bacteria for which an effective vaccine is available.⁴ Good data on the proportion of childhood deaths that are attributable to pneumonia in Pakistan are limited. Smoking and exposure to second-hand smoking is harmful specially for young children. Pneumonia infection is multifactorial but to find whether parental smoking has role in its development raises a serious concern since the number of people adopting smoking habit is increasing day by day.⁶

There is extensive evidence showing the association between smoking exposure and lung diseases, the effect of parental smoking on childhood pneumonia has not been fully explored.⁷ The purpose of this study is to find the association between parental smoking habit and pneumonia among children under five years of age in Peshawar city.

METHODOLOGY

It was un-matched case control study with a ratio of 1:1. Cases were children less than five years of age presenting to four major

tertiary care hospitals in Peshawar city (Lady Reading Hospital, Hayatabad Medical Complex, Kuwait Teaching Hospital and Khyber Teaching Hospital) with Pneumonia infection. Controls were selected from same hospital with medical condition other than respiratory infection. Patients were recruited by non-probability consecutive sampling technique from December 2018 to march 2019. Data were collected using structured questionnaire after getting permission from the hospital administration. Verbal Informed consent was taken from the parents of the children. Participants were excluded from the study that was reluctant to give informed consent. Data obtained were entered and analyzed in SPSS (version 20). A P-value of equal to or less than 0.05 was considered statistically significant.

RESULTS

A total sample size of 248 children with 124 cases and 124 controls were selected from four major tertiary care hospital of Peshawar city.

The mean age of the patients was recorded 30.42 months with a SD \pm 7.33. Among the total, 126 (51%) were male while 122 (49%) were female. 56% of the participant's family had \geq 11 household members followed by 43.5% had 4-10 and only 0.5% had \leq 3 household members. [Table 1]

Among the total sample of 248 children, 67 (27%) of the children's parents were smokers while 181 (83%) were not smoking. Pneumonia infection were twice likely to develop among those children who were exposed to parental smoking at home with an odd ratio of 2.02 (95% C: 1.14-3.60) [Table 2].

Table 1: Demographic Characteristics

	Cases	Control	Total
Age			
Mean Age in months	34.84 SD \pm 6.78	30.04 SD \pm 7.26	30.42 SD \pm 7.33
	Case n (%)	Control n (%)	Total n (%)
Gender			
Male	57 (46%)	69 (56%)	126 (51%)
Female	67 (54%)	55 (44%)	122 (49%)
Household members			
\leq 3	0 (0%)	1 (0.8%)	1 (0.5%)
4-10	56 (45%)	52 (42%)	108 (43.5%)
\geq 11	68 (55%)	71 (57.2%)	139 (56%)
Parental smoking			
Smokers	42 (32%)	25 (21%)	67 (27%)
Non-smokers	82 (68%)	99 (89%)	181 (83%)
Total	124 (100%)	124 (100%)	248 (100%)

Table 2: Parental smoking status in cases and controls:

	Case	Control	Odd Ratio (95%CI)	P value
Parents Smoking Status				
Smoking	42	25	2.02	<0.05
Not Smoking	82	99	(1.14 – 3.60)	

DISCUSSION

Although there is extensive evidence showing the association between smoking exposure and lung diseases, the effect of parental smoking on childhood pneumonia has not been fully explored. In a cohort study conducted in Norway by Haberg et al. enrolled 22,390 subjects, the study looked at the "tobacco smoking exposure in early life in relation to lung function" concluded that chronic respiratory diseases are significantly associated with parental or second hand smoking.⁸ Our study also supports these findings.

Another study done by Pattenden S et al, 2006 on parental smoking and children respiratory health reported a strong evidence linking parental smoking to different respiratory problems like bronchitis, asthma, wheezing and nocturnal cough with a mean odd ratio of 1.15.⁹ These results are consistent with our findings with an odd ratio of 2.02 (95% C: 1.14-3.60).

CONCLUSION

The findings from our study concluded that parental smoking is significantly associated with childhood pneumonia. Children exposed to second hand smoking are at high risk of developing respiratory problems like asthma later in life. Smoking at public places is already banned in Pakistan but more effective policies and strategies are required to limit the second hand smoking exposure at homes.

Recall and reporting bias may be the limitations of this study as we interviewed parents to collect information on their smoking habits.

The relationship between child and parents may differ in different societies with different cultural backgrounds. Further research like experimental studies to see the dose response relationship between parental smoking and childhood pneumonia would be beneficial to find the actual causal relationship.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Asif Rehman, Mustafa Javed, Hamza Khattak, Adnan Khan, Ammar Khattak, Muhammad Abdullah, Muhammad Ibrahim, Junaid Rehman, Athar Minullah, Zarak Bangash. Association between Parental Smoking and Pneumonia among Children Less Than 5 Years of Age. *Int J Med Res Prof*. 2020 Jan; 6(1):124-26. DOI:10.21276/ijmrp.2020.6.1.030