Frequency Of Depression Among Adolescents With Asthma: A Prospective Analysis

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Abstract

Objectives: To evaluate the frequency of depression among adolescents aged 13 to 19 years who visit medicine outpatient departments (OPD) for asthma.

Methods: This prospective, cross-sectional study was conducted in Outpatient Departments of Medicine, of Indus Medical College TM Khan. All the cases between the ages of 13 and 19 who visited the medicine departments and have been diagnosed as patients of asthma for at least one year were included. Patients with a history of major life events, such as the death of a family member or any other relevant severe trauma within the past 3 months, patients already on antidepressant treatment for the past 3 months, those with other diseases such as diabetes, tuberculosis, or epilepsy, and those with a history of substance abuse or dependence were not incorporated. Depression diagnosis was based on DSM-IV criteria, requiring the presence of at least five symptoms during the same two-week period, representing a change from previous functioning. Data was entered and analyzed using SPSS version 26.

Results: A total of 262 asthma patients were included, with a mean age of 16.63$\pm$4.8 years and average duration of asthma was 5.6 years. Among the participants, 169 (64.5%) were female. The family history of asthma was reported in 30 (11.4%) of the cases. Overall frequency of depression was found to be at 14.1% (n=37). In terms of gender, a significant difference was observed, with a higher occurrence of depression in males (78.4%) and patients with poor and middle socio-economic status (SES) (p = 0.001). Higher rates of depression were also among those who were illiterate compared to educated patients (p = 0.001).

Conclusion: Study revealed that depression is common among teenagers with asthma. Both asthma and depression are highly prevalent in teenagers as well as in adults, and emerging evidence indicates that these conditions often occur together.

Key words: Depression, asthmatic teenagers, age 13-19 years.

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Introduction

Asthma, recognized as a chronic ailment and a significant global health concern, impacts individuals of every age group. Globally, an estimated 235–300 million people experience asthma symptoms[1], and exhibits a prevalence among adolescents that ranges significantly, spanning from 0.9% to 21.3% across various countries[2,3]. In childhood, asthma is more commonly found in boys, while among adults, women tend to have higher prevalence rates, which can be traced to a shift in prevalence ratios following puberty[4,5]. It is primarily linked to allergic sensitization and a familial asthma history, but also correlates with environmental factors like exposure to tobacco smoke, vehicle emissions, and among adults, occupational hazards[4,6]. Throughout childhood, including adolescence, having asthma is linked to a diminished Health-Related Quality of Life (HRQoL), particularly when the asthma remains unmanaged[7]. HRQoL, covering physical, social, and mental well-being, plays a crucial

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role in understanding the overall impact of the condition on patient health, serving as a valuable supplement to clinical assessments of disease status[7,8].

In this context, adolescents undergo a period of exploration where they define their identity and personality, encountering a plethora of new emotions. The presence of illness can significantly and detrimentally impact the psychological development process during this stage[9]. Consequently, the severity of asthma, its management, and the medications used are intimately associated with heightened levels of anxiety and depression among adolescents[9,10] Based on research examining the enhancement and assessment of mental health among children and adolescents in Korea, while there has been a general improvement in the psychological well-being of Korean youth over time, a significant portion still grapple with mental health challenges, and their specific issues show little signs of improvement[11]. Furthermore, adolescents between the ages of 15 and 17 represent nearly a quarter of the world's population, underscoring the critical importance of effectively managing and screening the mental health of individuals within this age group[11]. However, there has been a lack of comprehensive research conducted at the local level, and physicians often do not prioritize the assessment of depressive symptoms in adolescent asthma patients. This oversight can lead to worsened symptoms and increased morbidity among this demographic. Given that a significant portion of adolescent asthma cases are managed by primary care providers, integrating screening for depressive disorders could significantly improve patient management. Therefore, this study aims to assess the frequency of depression among adolescent asthma patients, addressing this overlooked health concern and developing management strategies to enhance the quality of life for these adolescents.

Methodology

This prospective, case series study was conducted in Outpatient Departments of Medicine, of Indus Medical College TK Khan. Study was conducted during six months from January 2023 to July 2023. Sample size of 262 patients was calculated

using WHO formula ($n = \frac{Z^2 \cdot p(1-p)}{E^2} = E = \sqrt{\frac{Z^2 \cdot p(1-p)}{n}}$) using a proportion of (anxiety symptoms to be 33% in Asthmatic *adolescents*)[12], a 95% confidence level, and a margin of error of approximately 5.7%. All the adolescent individuals with age range of 13 to 19 years, both genders, visiting the medicine OPD and department, who have been diagnosed as the case of asthma for at least one year were included in the study. Patients with a history of major life events, such as the death of a family member or any other relevant severe trauma, within the past 3 months were excluded. Additionally, patients already on antidepressant treatment in the past 3 months, those with other diseases such as diabetes, tuberculosis, or epilepsy, and those with a history of substance abuse or dependence were excluded. Nonprobability consecutive sampling technique was used. Participants were interviewed by a researcher in a private, quiet room after obtaining informed verbal and written consent and explaining the details of the study. The questionnaire collected demographic information, including the age of patients, gender, disease duration, level of the education, socioeconomic status, and family history of asthma. Additionally, it included questions based on DSM IV criteria for diagnosing depression. According to the criteria outlined in the DSM-IV, a diagnosis of depression is established when an individual experiences at least five of the following symptoms concurrently over a continuous two-week period, which represent a departure from their usual functioning. At least one of these symptoms must include either a consistently depressed mood or a pervasive loss of interest or pleasure in previously enjoyed activities. The symptoms are as follows: 1) experiencing a depressed mood for most of the day, nearly every day; 2) markedly reduced interest or pleasure in nearly all activities; 3) significant weight loss or gain, or a notable decrease or increase in appetite; 4) insomnia or hypersomnia occurring almost every day; 5) observable psychomotor agitation or retardation; 6) persistent fatigue or loss of energy; 7) feelings of worthlessness or excessive guilt; 8) impaired ability to think clearly or concentrate, or recurring indecisiveness; and 9) recurrent thoughts of death, ideas of suicide without a

specific plan, or an actual suicide attempt or plan. It focuses on symptoms of depression in asthmatics in the past 2 week, to minimize the recall bias. All the information was collected via study proforma, and SPSS version 26 was used for data analysis. Chi-square test was applied and a p-value ≤ 0.05 was taken as significan

Results

A total of 262 asthma patients were included in this study, with a mean age of 16.63 $\pm$ 4.8 years and average duration of asthma was 5.6 years. Among the participants, 93 (35.5%) were male and 169 (64.5%) were female. Regarding their residential distribution, 144 (55.0%) were from rural areas, while 118 (45.0%) resided in urban areas. In terms of marital status, 219 (83.5%) were unmarried, while 43 (16.5%) were married. Socioeconomic status varied among the patients, with 166 (63.3%) classified as poor, 68 (26.0%) as middle class, and 28 (10.6%) as wealthy. Education levels varied as well, with the majority (35.4%) being illiterate, followed by 15.2% primary education, 12.2% secondary education, 18.2% matriculation, and (19.0%) intermediate education. Family history of asthma was reported in 30 (11.4%) cases, while 45 (17.1%) cases had a family history of depression. Table no.1.

In this study, it was observed that out of all participants, the overall frequency of depression stood at 14.1%, with a total of 37 individuals being affected.

In terms of gender, a significant difference was observed, with a higher occurrence of depression in males (78.4%) compared to females (21.6%) (p = 0.001). Similarly, there were higher rates of depression among patients with poor and middle socioeconomic status (SES) compared to those with higher SES (p = 0.001). However, no significant difference was found based on residence. Regarding educational status, there was a notable variation, with higher rates of depression among those who were illiterate compared to those with higher education levels (p = 0.001). Table no. 2

Table. 1. Demographic characteristics of the patients n=262

Variables		Statistics n (%)
Age	Mean+SD	16.63 $\pm$ 4.8 years
Duration of disease (Asthma)	Mean+SD	5.6 $\pm$ 1.32 years
Gender	Males	93 (35.5)
	Females	169 (64.5)
Residence	Rural	144 (55.0)
	Urban	118 (45.0)
Marital status	Single	219 (83.5)
	Married	43 (16.5)
Socioeconomic status	Poor	166 (63.3)
	Middle	68 (26.0)
	Upper	28 (10.6)
Educational status	Illiterate	93 (35.4)
	Primary	40 (15.2)
	Secondary	32 (12.2)
	Matric	48 (18.2)
	Intermediate	49 (19.0)
Family history of asthma	Yes	30 (11.4)
	No	232 (88.6)

Table.2 Frequency of depression demographic characteristics n = 262

Variables		DEPRESSION N(%)		Total n(%)	p-value
		Yes	No		
Gender	Males	29 (78.4)	64 (28.4)	93 (35.5)	0.001*
	Females	8 (21.6)	161 (71.6)	169 (64.5)	
Residence	Rural	20 (54.1)	124 (55.1)	144 (55.0)	0.995
	Urban	17 (45.9)	101 (44.9)	118 (45.0)	
Marital Status	Single	19 (51.4)	200 (88.9)	219 (83.6)	0.0001**
	Married	18 (48.6)	25 (11.1)	43 (16.4)	
Educational status	Illiterate	25 (67.6)	68 (30.2)	93 (35.5)	
	Primary	5 (13.5)	35 (15.6)	40 (15.3)	0.0001**
	Secondary	2 (5.4)	30 (13.3)	2 (12.2)	
	Matric	2 (5.4)	44 (19.6)	46 (17.6)	
	Intermediate	3 (8.1)	48 (21.3)	51 (19.5)	
Socio-economic status	Poor	16 (43.2)	149 (66.2)	165 (63.0)	0.001*
	Middle	17 (45.9)	51 (22.7)	68 (26.0)	
	Upper	4 (10.8)	25 (11.1)	29 (11.1)	

* P value is statistically insignificant calculated by Fisher's exact test of chi square
** P value is statistically highly significant calculated by Pearson's test of chi square

Discussion

Depression represents a pertinent comorbidity in asthma, correlating with notably diminished quality of life, inadequate asthma management, heightened exacerbation rates, and greater healthcare resource utilization[11]. However, in developing countries such as Pakistan, there is a scarcity of data on this subject. Therefore, the present study was conducted to explore health hazards in 262 adolescent asthma patients, with an average age of

16.63 ± 4.8 years, with females comprising 64.5% and males 35.5% of the sample. Consistently Cunha MS et al[13], found that their study encompassed 614 individuals diagnosed with asthma, with an average age of 32.6 ± 16.9 years and among 447 adult participants adults, 397 (64.7%) were females. The study by Licari A et al[10] enrolled 40 consecutive adolescents diagnosed with severe asthma, with an average age of 14.18 ± 1.97 years, while inconsistently they found a predominance of males, with 22 males compared to 18 females and this gender difference may be due to their sample size very limited compared to this study. Corresponding to our study, Khan M et al[14] reported a sample size of 133 participants, comprising 78 females (58.6%) and 55 males (41.4%), with an average age of 15.5 years. The exact pathophysiology behind the female predominance in adolescent asthma patients remains unclear, but it has been hypothesized that several factors may contribute to this trend like hormonal variances between males and females could be influential, as estrogen has been associated with heightened airway hyperresponsiveness and inflammation. Additionally, societal, and cultural factors might impact healthcare-seeking behavior, potentially leading females to be more proactive in reporting and seeking treatment for asthma symptoms compared to males.

In this study regarding residential distribution, 144(55.0%) were from rural areas, while 118 (45.0%) resided in urban areas, most of the patients 166 (63.3%) classified as poor socioeconomically, with the majority (35.4%) being illiterate, followed by 45 (17.1%) cases had a family history of depression. These findings are almost similar to the study by Ali S et al[15], as most of the patients had poor socioeconomic status and lowered educational level. As per the findings by Arsalan MH et al,[16] the collective literacy rate among asthmatic individuals was alarming, standing at around 45%. The geographical disparity in literacy rates is largely influenced by socio-ethical factors. Particularly, the lowest literacy rate category predominantly prevails in slum areas, ranging from 29% to

69% across the study region. Our findings were also supported by the Cunha MS et al[13].

In this study, it was observed that among the teenage participants, the overall frequency of depression stood at 14.1%, with a total of 37 individuals being affected, followed by depressive symptoms were significantly higher among males, illiterate individuals and those having poor socioeconomic status (p-0.001). Consistently according to Licari et al[10], 16.1% of asthmatic adolescents displayed anxious symptoms as identified by CASI, and 11.5% exhibited depressive symptoms as indicated by CDI. Bardach et al[17], reported that 24.7% of adolescents received diagnoses of anxiety, depression, or both. Conversely, Grosso et al[18], discovered comparable results, with a depression prevalence of 16.7% among adolescents with asthma. On the other hand, Kulikova et al[19] discovered a statistically significant correlation between symptoms of depression and anxiety and asthma outcomes (P < .001). A substantial effect size indicated that 37.2% of the variance is jointly accounted for by depression and anxiety symptoms and asthma outcomes within the overall sample[19]. Furthermore in the line of this series Saragondlu et al[20] assumed a 13% prevalence of anxiety and depression, with a 95% confidence level and 5% absolute precision. Accordingly, they enrolled a total of 176 children aged 6 years and older with asthma from the clinic of asthma[20]. In contrast, Park et al[21], reported that a total of 41.2% of female respondents indicated experiencing depression, a notably higher percentage than the 27.5% observed among male respondents. Similarly, Ali et al[15], observed a higher occurrence rate of Depressive disorder and Anxiety symptoms among asthma patients, with 91% experiencing depression. These variations in the prevalence of depression among adolescent asthma sufferers across studies may be attributed to differences in sample size, geographical variations, environmental factors, and criteria for selecting study participants, as well as variances in management strategies employed across different countries. However, it's important to acknowledge that this study has also several limitations, includ-

ing a limited sample size, being conducted at a single center, and lacking a control group. Therefore, large-scale multicenter studies are warranted to validate these findings and provide more comprehensive insights.

Conclusion

Given the significant rates of asthma and depression in adolescent populations, integrating psychological assessment into the asthma management for adolescent patients could be beneficial in clinical practice. Additionally, considering the evidence of their frequent co-occurrence, further research into comorbidity is essential. By improving therapeutic attitudes and communication, gaining a better understanding of adolescents with asthma can reduce the burden of depression and enhance their quality of life.

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