Clinical and functional features of respiratory tract diseases in children in the Aral-Sea region.

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ABSTRACT

The Aral-Sea shrinking to less than half of what it once was. Because of this, more than 40,000 square kilometers of the highly salinized seabed are now exposed and frequently buffeted by winds. This research compared children those are living in "the significantly impacted disaster area" (around 100-200 kilometers of the Aral-Sea) to children those are living in "the mildly affected disaster area" to look at respiratory tract symptoms and function (i.e., located almost 500 kilometers from the Aral-Sea). 250 kids aged 6 to 15 who resided in the research region and 100 students who lived in the reference area participated in a questionnaire-based interview. Both 250 children in the research region and 100 children in the reference area had pulmonary function testing. More study group individuals had a cough or were now wheezing, The % predicted forced-expiratory-volume in 1 second (FEV-1) and dust exposure showed some indication of an inverse association during the summer, but the converse was true during the winter.Peak flowmetry indications between 100 and 80% of the appropriate value were regarded as a deviation from the norm for determining the severity of obstructive syndrome; There are three levels of the obstructive syndrome: mild (80–70%), mode speed (70–60%), and severe (less than 60%).

Keywords: Catastrophe, respiratory tract problems, prevalence, pulmonary dysfunction.

Introduction:

Khorezm and Karakalpakistan, one of Uzbekistan's twelve provinces, were both nourished by the ancient Oxus, now known as the Amu Darya, which was one of Central Asia's main historical civilizations. For at least three thousand years, the Amu Darya and Syr Darya rivers' waters have supported thriving agricultural populations in the Aral-Sea Basin (ASB).But starting in the late 1950s, the Amu Darya and Syr Darya rivers were heavily exploited during the Soviet era (1924–1991) and utilized in massive irrigation systems to ensure the production of cotton, the so-called "White Gold." From 4.5 million hectares in the 1950s to 7.9 million ha in 2006, the ASB's irrigated land area than quadrupled. [1,2]

In the northwest of Uzbekistan, over a land area of 165,000 square kilometers, sits the Autonomous Republic of Karakalpakstan. The Karakalpakstani area is traversed by the Amu-Darya River. This area has borders with Kazakhstan, Khorezm Province in Uzbekistan, and Turlilometersenistan (in the south) (in the north). More than 1.5 million individuals live there. Turkic, a language more closely related to Kazakh than to Uzbek, is the official language of the Republic of Karakalpakstan. [2,3,4]

Here are some problems faced by the people in these areas.

Environmental Problems

- Quality of Water
- The Health Problems
- Agricultural problems
- Economic Issues

The area highlighted by a red circle is the area most affected while the area in the yellow circle also faces health and ecological problems.

Background:
Anecdotally, people of the Aral-Sea region report a rise in the occurrence of respiratory tract ailments, especially in youngsters. It is widely believed that dust from the Aral-Sea bed is to blame for this.

Methods:
We performed a survey to better below standrespiratory tract symptoms and lung function in children aged 6 to 15 living in 18 settlements across two different geographic areas in the Aral-Sea region. Throughout the study's length, we analyzed monthly dust deposition rates.

The Health Problems:
Long-term impacts of environmental pollution exposure on public health are beginning to be recognized. The population in the region surrounding the Aral-Sea is typically in poor health based on socioeconomic and ecological factors, as well as a breakdown in the healthcare system after the fall of the Soviet Union.The region's declining economic health directly affects the region's failing ecological

status, which is also getting worse. The prevalence of diseases seems to be rising, especially anemia, tuberculosis, kidney and liver disorders, respiratory tract infections, allergies, and cancer, which are all significantly higher than in the rest of the former USSR and modern-day Russia [3, 5].

For more than 20 years, this area has seen high rates of reproductive diseases (infertility, miscarriages, and problems during pregnancy, and birth). In a poll of 5,000 couples, 16% of them had infertility issues. Male infertility among infertile couples grew from 30–40% in the 1980s to 65% in the late 1990s. In 1998, the miscarriage rate increased to 18%. Another major impact of pollution is the rise in the frequency of abnormal births. In comparison to European countries, one in every twenty kids is born with an abnormality.

Studies done in 2000 looked at how well the local kids' lungs functioned. Schoolchildren in a region 200 kilometers from the Aral-Sea had a low vital capacity and a high cough rate. Surprisingly, there was no correlation between dust exposure and the occurrence of asthma. Consequently, it is yet unknown if the environmental catastrophe has directly affected how frequently respiratory tract diseases occur.

Genome instabilitya combination of alterations that characterize the development of a normal cell into a tumor—was found, and it was more pronounced in Khorezmyoungsters. There were significant positive associations between children's anxiety levels and the rate of blood cell division in culture, which is linked to early aging processes (p 0.05). The information gathered allows the authors to recognize that the high occurrence of children in the Aral-Sea basin, as well as increased genomic instability and its sensitivity, are (indirect) repercussions of socio-economic problems such as poverty, hunger, etc. [6,7]

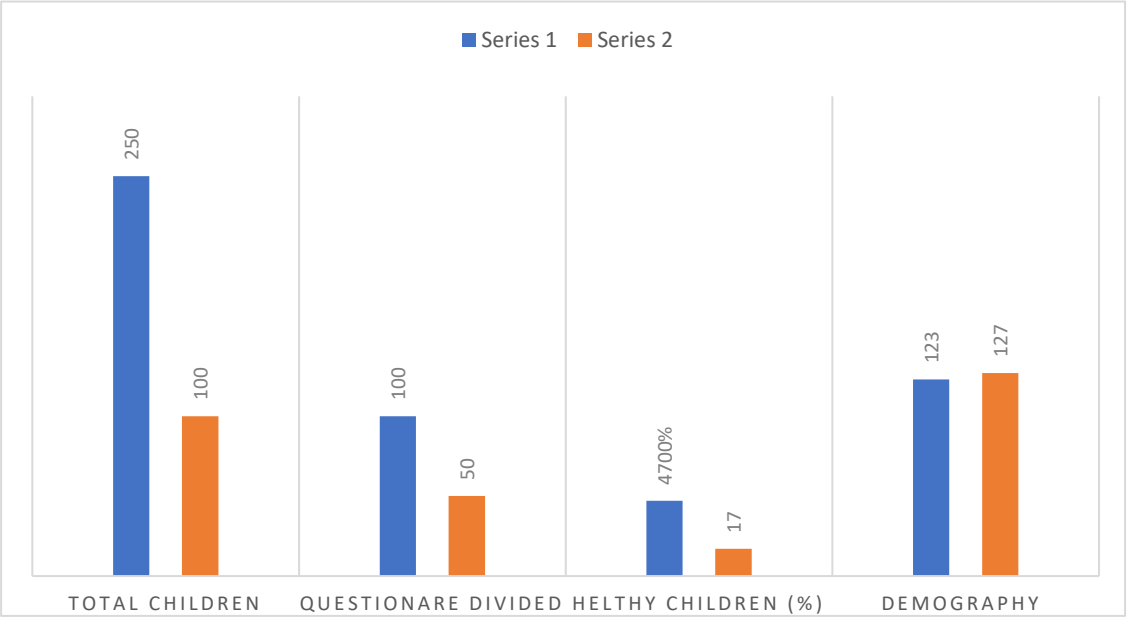
The occurrence of IDA among children aged 0 to 14 in Uzbekistan in the last decadewas much less, according to official data from the Ministry of Health. Children below the age of three had the greatest anemic prevalence rates, at 69% [7]. The majority of researchers have found a link between late cognitive development and IDA in infants up to one year of age. Additionally, it was shown that iron deficiency, even in the absence of anemia, can have negative effects on the child's neurodevelopment and behavior, some of which may be permanent [8].

Comparative investigations of the occurrence of children below 3 years old have shown that respiratory tract illnesses, anemia, and digestive disorders are the most common in both theKhorezm andKaralalpakistan areas. Furthermore, the prevalence of these disorders was much greater in the Karalalpakistan region.

It has been demonstrated that several xenobiotics, including insecticides, biphenyls, and methylcholanthrene, may drastically lower the amount of Vit-A in the liver and so interfere with the body's ability to absorb this vitamin.A comparable circumstance may occur in circumstances of simultaneous exposure to xenobiotics in environmentally crisis-affected places, infectious illnesses, and potentiated expression., and other illnesses, in particular, liver and kidney-related diseases, along with greater risk to the population's health, especially that of children.

Discussion and Results:

In the Khorezm and Karakalpakistan areas, a review of children's health groups revealed that the second group of the children investigated is the health group (47.0%), followed by the third group (17.0%).



A diagnosis of vegetative-vascular dystonia is made in 25–81.5% of children, according to data from diverse literature sources. The onset of major pathological problems including arterial hypertension, bronchial asthma, stomach ulcers, etc. might be accelerated in children with vegetative illnesses. Predisposing variables for vegetative dysfunctions may consistof foci of chronic infections including chronic tonsillitis, caries, pharyngitis, and sinusitis [14]. In most cases, inadequate nutrition, harsh weather, climatic aspects, anot-suitable environmental situation, an imbalance of minute elements, and hormonal reorganization of the pubertal phase are the direct causes of autonomic dysfunction [15]. All of these elements are unique to the Aral-Sea area and may contribute to the development of autonomic dysfunction in local youngsters.

Table1.Percentage Of Kids Studied Who Experienced Symptoms Similar To Asthma.

Symptoms	Khorezm Region (250kids)		Karakaloakistanregion (100kids)	
	#	%	#	%
ahistoryofwheezing	60	24.4	30	29.6
wheezingin thelast12 months	55	22.0	25	25.2
attacksofnightsuffocation	45	17.0	15	15.2
wheezingduring exercise	45	17.0	17	17.2
isolatednocturnalcoughinthelast 12 months	45	17.0	13	12.8

Peak flowmetry was used to investigate how external respiration (HPF) works. A thorough evaluation of youngsters aged 6 to 15 years old involved 250 children in the Khorezm area and 100 in the village of Karakalpakistan. The following procedures were used to determine the severity of obstructive syndrome: peak flowmetry indications that ranged from 100 to 80% of the appropriate value were considered out of the ordinary; There are three levels of the obstructive syndrome: mild (80–70%), moderate (70–60%), and severe (less than 60%). [16]

Conclusions:

In the vicinity of the Aral-Sea, asthma occurrence is low, and it doesn't seem to be correlated with exposure to dust. The primary differences in lung function between geographical locations were not explained by exposure to dust, however, lung function may be negatively impacted by summertime exposure to high levels of dust.There is no proof that the local yearly dust deposition and any particular respiratory tract ailments are related. Results for lung function also revealed regional variance that was not accounted for by yearly dust deposition. However, after controlling for a geographic region, there was some evidence of an inverse relationship between the percentage predicted forced expiratory volume in 1 second (FEV1) and dust exposure during the summer the opposite was true in the winter.Peak flowmetry values that ranged from 100 to 80% of the appropriate value were considered to be beyond the norm for determining the severity of the obstructive syndrome. 80 to 70% of people have the mild obstructive syndrome, 70 to 60% have moderate obstructive syndrome, and less than 60% have the severe obstructive syndrome.

The prevalence of restrictive pulmonary dysfunction was 4 to 5 times greater in the study group (8.6%) than in the reference group (2.6%), and the percentage of projected forced vital capacity (FVC% predicted) was lower in the study group statically (median = 94 to 95%) than in the reference group (100%). The results of multivariate analysis showed that FVC% predicted was lower in the study region and among females, but was unrelated to socioeconomic characteristics. Surprisingly, there was no correlation between dust exposure and the occurrence of asthma. Consequently, it is yet unknown if the environmental catastrophe has directly affected how frequently respiratory tract diseases occur.

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