ISSN: 2413-9122
e-ISSN: 2518-7295
Volume 1 No. 1, December 2021

The Official Journal of the
Azerbaijan Medical Association

AMAJ

Azerbaijan Medical Association Journal

www.amaj.az

MD Publishing

AMAJ Azerbaijan Medical Association Journal

Official Journal of the Azerbaijan Medical Association

Volume 1 • No. 1 • December 2021

DOI

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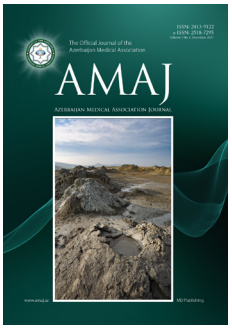
The Cover: Mud volcano

Azerbaijan has the most mud volcanoes of any country, spread broadly across the country. 350 of the 700 volcanoes of the world are in the Azerbaijani Republic.[1] Local people call them "yanardagh" (burning mountain), "pilpila" (terrace), "gaynacha" (boiling water) and "bozdag" (grey mountain) alongside its geographical name – mud volcanoes.

About 200 eruptions have occurred in 50 volcanoes in the territory of Azerbaijani Republic since 1810. Eruption of mud volcanoes is accompanied by strong explosions and underground rumbling. Gasses come out from the deepest layers of the earth and immediately ignite. A height of a flame over volcano reaches 1000 meters (Garasu volcano). Toragay volcano erupted 6 times from 1841 to 1950.

Mud volcanoes are associated with oilfields. Rich oil and gas fields are found in the territories of mud volcanoes (Lokbatan, Garadagh, Neft Dashlari, Mishovdagh and others). In addition, lava, mud and liquid erupted by mud volcanoes are used as raw materials in chemical and construction industries and also in pharmacology.



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AMAJ Azerbaijan Medical Association Journal

Official Journal of the Azerbaijan Medical Association

Volume 1 • No. 1 • December 2021

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Original Article
DOI: 10.5455/amaj.2021.01.001

The impact of ABO blood groups on SARS-CoV 2 infection susceptibility and prognosis

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Background and aim: Severe acute respiratory syndrome coronavirus SARS-CoV-2 is the causative agent of the global pandemic coronavirus disease 2019 (COVID-19). We aimed to investigate the susceptibility to Covid 19 infection and severity and outcomes of the disease with respect to different ABO blood groups.

Material & methods: A total of 568 subjects admitted with Covid-19 infection are retrospectively evaluated. The demographic data, clinical characteristics, radiological and laboratory findings, ABO and RH blood groups and outcomes of the disease are recorded.

Results: The mean age of 297male (52.3%) and 271 female (47.7%) subjects was 58.11 ±17.14 years(19-95). The distribution of Covid patients with respect to ABO blood groups is as follows: blood group A 46.7%(n=164), blood group O 28.9% (n=265), blood group B 15.3% (n=87) and blood group AB 9.2 %(n=52). Hypertension was the most frequent comorbidity in all blood groups. The duration of hospital stay is significantly longer in subjects with blood group A and intensive care unit (ICU) admission rates were significantly higher in blood groups A and AB.

Conclusion: A blood group tends to be more commonly infected with SARS-CoV-2 while blood group O patients have lower risk. ABO and Rh blood groups can be considered as a biomarker to predict the risk of SARS-CoV-2 infection susceptibility and fatality.

Keywords: Covid 19; blood groups; SARS-coV-2

Introduction

A public health crises has first emerged in the city of Wuhan, Hubei province in China in December 2019. This was a viral infection caused by a novel enveloped RNA betacoronavirus named as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Subsequently, the rapid surge in the number of coronavirus disease 2019 (COVID-19) cases has turned out to be a global problem. The world has previously experienced respiratory tract virus infections such as influenza A virus subtypes H1N1 and H5N1, SARS-CoV1, MERS-CoV and Ebola. However, this new coronovirus, the SARS-CoV2 has caught most of the world unprepared. Due to highly contagious nature and rapid human to human transmission, it has spread worldwide and the World Health Organisation (WHO) has declared COVID-19 as a global pandemic on March 11, 2020 [1]. This is the date when the first confirmed Covid-19 case in our country was reported. Covid-19 may emerge in a wide spectrum of clinical presentations ranging from mild symptoms to severe pneumonia and respiratory failure. Which biomarkers predict the susceptibility to COVID-19 and the severity of the infeciton are not clearly elucidated. In the current study, we aimed to investigate the predisposition to Covid 19 infection as well as severity and outcomes of the disease with respect to different ABO blood groups.

Material & Methods

In this single-centre study we recruited adult Covid-19 patients who were admitted to our clinics. Covid-19 diagnosis was based on contact history, clinical presentation, signs and symptoms and laboratory and radiological data.

The demographic data including age and gender, clinical characteristics and comorbidities of all patients were recorded. All subjects had been computerized tomography (CT) scanned on admission and radiological findings were recorded. Laboratory test results on admission were recorded. These included complete blood count, renal function tests, hepatic function tests, D-dimer, ferritin, CRP and ABO Rh blood groups. The medications used, duration of hospital stay and clinical outcomes were recorded.

Throat-swab specimens from the oropharynx and nasopharynx were obtained from all patients at admission and were put in viral-transport medium. SARS-CoV-2 was confirmed by real-time RT-PCR (reverse transcriptase polymerase-chain-reaction) test . The local Medical Research Ethics Committee approved the study. All patients had signed informed consent.

Statistical analyses were performed using SPSS software (version 17.0) The associations between blood groups (ABO and Rh) and comorbidities and gender were evaluated by using logistic regressions of risk factors on blood groups. Chi-square test was used to find out whether blood group distributions differed between the compared populations. To compare A blood group-vs-non-A blood groups and Rh positive and negative groups, we reported p-values from Fisher's exact test (two-sided), odds ratio and odds ratio confidence intervals.

Results

A total of 568 patients were included in the study; 297 (52.3%) were males and 271(47.7%) were females. The mean age of the subjects was 58.11 ±17.14 years, ranging from 19 to 95 years. The distribution of subjects with respect to ABO and Rh blood groups is demonstrated in Table 1. Nearly half of the cases (46.7%; n=265) had blood group A. A flowchart showing the outcomes of male and female subjects with respect to ABO and RH blood groups takes place in Figure 1. The most frequent comorbidities were hypertension and DM. The distribution of accompanying diseases in different blood groups is shown in Table 2. The mean ages of subjects in different ABO blood groups were similar. The laboratory data did not show significant difference in different blood groups. The length of hospital stay was similar between the groups; however, ICU admission rates were significantly higher in blood groups A and AB (Table 3). As mentioned, blood group A was the most frequent blood group. We compared A group with non-A groups and found out that malignancy was more common in group A subjects with statistical significance. The duration of hospital stay is significantly longer in subjects with blood group A (Table 4)CT findings of

Table 1. The distrubition of subjects with respect to ABO and Rh blood groups.

	n	%	Female/ male (n)	Age (mean±SD)	Total n (%)
0 Rh+	147	25.9	80/67	58.92±18.07	164 (28.9)
Rh-	17	3.0	10/7	63.59±12.88	
A Rh+	232	40.8	105/127	58.56±16.34	265 (46.7)
Rh-	33	5.8	14/19	57.73±19.09	
B Rh+	81	14.3	42/39	54.54±17.69	87 (15.3)
Rh-	6	1.1	2/4	69.33±12.24	
AB Rh+	42	7.4	13/29	56.83±17.32	52 (9.2)
Rh-	10	1.8	5/5	55.20±15.41	

Table 2. Comorbidities

	0	A	B	AB	*p*
Hypertension	74 (45.1%)	87 (32.8%)	35 (40.2%)	15 (28.8%)	***0.02***
DM	42 (25.6%)	61 (23.0%)	21 (24.1%)	9 (17.3%)	*0.90*
Obstructive lung disease	21 (12.8%)	36 (13.6%)	9 (10.3%)	4 (7.7%)	*0.65*
Cardiovascular disease	28 (17.1%)	52 (19.6%)	12 (13.8%)	12 (23.1%)	*0.12*
Chronic renal failure	14 (8.5%)	13 (4.9%)	1 (1.1%)	1 (1.9%)	***0.05***
Malignancy	12 (7.3%)	29 (10.9%)	3 (3.4%)	3 (5.8%)	*0.14*

Table 3. Comparison of data based on ABO blood groups

	0	A	B	AB	*p*
Age	59 ± 17	58 ± 16	56 ± 18	57 ± 16	*0.33*
Leucocyte count (n/µl)	7174	7542	7126	6621	*0.55*
Lymphocyte count (n/µl)	1367	1408	1339	1473	*0.75*
Lactate dehydrogenase (U/L)	277	308	281	272	*0.37*
D-dimer (µg/L)	1671	2141	1543	918	*0.16*
Creatinine (mg/dL)	1.16	1.01	1.95	0.82	*0.2*
Ferritin (µg/L)	283	349	481	295	*0,41*
Duration of hospital stay (days)	7.26	8.28	6.37	7.52	*0,1*
ICU admission n (%)	16 (9,8)	42 (15,8)	8 (9.2)	8 (15.4)	***0,001***

Table 4. Comparison of A and non-A blood groups

	A	Non-A	p	OR	95% CI
n	265	303			
Age	58.45	57.81			
Male/female	146/119	151/152	0.23	1.23	0.88-1.71
Hypertension, n (%)	87 (32.8)	124 (40.9)	0.05	0.70	0.50-0.99
DM, n (%)	61 (23.0)	72 (23.8)	0.84	0.95	0.65-1.41
Obstructive lung disease, n (%)	36 (13.6)	34 (11.2)	0.44	1.24	0.75-2.05
Cardiovascular disease, n (%)	52 (19.6)	52 (17.2)	0.51	1.17	0.77-1.80
Chronic renal failure, n (%)	13 (4.9)	16 (5.3)	1.00	0.92	0.43-1.96
Malignancy, n (%)	29 (10.9)	18 (5.9)	***0.03***	1.94	1.05-3.59
Leucocyte count (n/µl)	7542	7065	0.23		
Lymphocyte count (n/µl)	1408	1377	0.64		
Lactate dehydrogenase (U/L)	307.8	277.5	0.07		
D-dimer (µg/L)	2141	1510	0.06		
Creatinine (mg/dL)	1.01	1.33	0.28		
Ferritin (µg/L)	349.5	337.4	0.86		
Duration of hospital stay	8.28	7.05	0.02		

Table 5. Comparison of Rh positive and negative groups

	Rh (+)	Rh (-)	p	OR	95% CI
n	502	66			
Age	57.87	59.91	0.35		
Male/female	262/240	35/31	0.89	0.96	0.57-1.61
Hypertension, n (%)	186 (37.1)	25 (37.9)	0.89	0.96	0.56-1.63
DM, n (%)	120 (23.9)	13 (19.7)	0.53	1.28	0.67-2.43
Obstructive lung disease, n (%)	65 (12.9)	5 (7.6)	0.31	1.81	0.70-4.68
Cardiovascular disease, n (%)	92(18.3)	12 (18.2)	0.97	1.01	0.51-1.96
Chronic renal failure, n (%)	22 (4.4)	7 (10.6)	0.06	0.38	0.15-0.94
Malignancy, n (%)	43 (8.6)	4 (6.1)	0.63	1.45	0.50-4.18
Leucocyte count (n/µl)	7308	7134	0.69		
Lymphocyte count (n/µl)	1393	1381	0.90		
Lactate dehydrogenase (U/L)	295.37	265.51	0.08		
D-dimer (µg/L)	1899	1027	***0.001***		
Creatinine (mg/dL)	1.17	1.25	0.75		
Ferritin (µg/L)	351.28	287.53	0.34		
Duration of hospital stay	69 (13.8)	5 (7.5)	***0.001***		

all patients were evaluated and were grouped as no radiological involvement, involvement of single lung or involvement of both lungs. The distribution of radiographic findings is demonstrated in Figure 2. In all blood groups, bilateral involvement of the lungs was the predominant feature.

ICU admission rates were 9.8% in blood group O, 15.8% in blood group A, 9.2% in blood group B, 15.4% in blood group AB. Exitus rates were 3.7% in blood group O, 6% in blood group A, 2.3% in blood group B, 5.8% in blood group AB.

The clinical features and laboratory data of Rh positive and negative subjects is demonstrated in Table 5.

Discussion

In this comprehensive research, we observed association between ABO blood groups and Covid 19 infection. Blood group A subjects tends to be more commonly infected with SARS-CoV-2. Consistent with previous studies on SARS-CoV -1 and recent studies on SARS-CoV-2, O blood group seems to be affected less [2-4]. Rh positive and negative subjects with SARS-CoV-2 infection had similar features with respect to demographic data and comorbidities, however Rh-positive cases had significantly higher rates of ICU admission.

Since onset of the outbreak, the factors associated with increased susceptibility have been investigated. The infection exhibits a very wide spectrum of severity. Male gender, age and chronic underlying diseases such as cardiovascular diseases including hypertension, diabetes mellitus, cerebrovascular diseases, immunosuppression are reported to be associated with increased COVID 19 risk for morbidity and mortality. On the other hand, it is also likely that other inborn factors will prove to be relevant to predict the predisposition and severity of the

infection. In a recent study from China, it has been reported that cases having blood group A had a higher susceptibility for SARS-CoV-2 infection and more severe disease whereas risk was lower in blood group O [4].

Viral infection susceptibility and ABO blood group interactions have been investigated for decades. The subjects with blood group O seem to be effected more by Norwalk virus [5] and Helicobacter pylori [6]. Blood group A has been associated with increased risk of susceptibility to severe acute respiratory syndrome [2].

It has been suggested that the ACE2 protein is the SARS-CoV virus receptor and me-diates the transferring enzyme activities. Therewithal, the actual and/or additional host and pathogen binding seems to be an intermediate hybrid O-glycan. O-glycosylation plays a key role in the pathogenesis of coronavirus infections. This involves the formation of hybrid, serologically A-like, O-GalNAcα1-Ser/Thr-R, T nouvelle (Tn) antigenic structures. In blood group O, polyreactive nonimmune or innate immunoglobulin M (IgM) controls the expression and qualities of the syngeneic A-like/Tn structures. The pathogen becomes exposed to the anti-ABO isoagglutinin activities. In the non-O blood groups,on the other hand, the anti-A, B and O-isoagglutinin activities are downregulated by being neutralized through the ABO-phenotype-determining enzymes. Therefore, blood group A is the preferred target for the virus [7].

In a recent study from our city, the distribution of blood groups are as follows: 38.3% A Rh (+), 29.4% O Rh (+), 13.2% B Rh (+), 6.4% AB Rh (+), 5.5% A Rh (-), 4.4% O Rh (-), 2.1% B Rh (-), 0.7% AB Rh (-) [8]. Taking our study population into account, Covid patients had blood groups as follows: 40.8% A Rh (+), 25.9% O Rh (+), 14.3% B Rh (+), 7.4% AB Rh (+), 5.8% A Rh (-), 3% O Rh (-), 1.1% B Rh (-), 1.8% AB Rh (-). It is clearly observed that blood group A is higher in the infected group compared to the whole population, whereas blood group O is lower in the infected group.

There are several limitations of the study. The study population consists of subjects admitted to the hospital. The subjects who presented milder forms of the infection and treated in outpatient's basis are not included. We do not have a control cohort group of healthy subjects from our hospital; however, this may not be a major issue since the distribution of blood groups is compared with the normal population reported previously. The association between Rh positivity and poor prognosis might have the bias of small proportion of Rh-negative cases. Nevertheless, this ratio reflects the whole population.

Certainly, susceptibility to an infection and its severity depend on various factors and solely blood group cannot be predicted as a risk factor. Nobody should take SARS-CoV-2 lightly, but prioritization of the most vulnerable population is essential. Especially blood group A and RH positive subjects should take stronger precautions.

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Original Article
DOI: 10.5455/amaj.2021.01.002

Assessment of Anxiety, Depression and Hopelessness of the Mothers of Children with Cancer: A Pilot Study of Comparing Evaluation Scales

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Objective: The impact of cancer on patients' psychology and their relatives is very significant during the whole treatment process. The aim of this study is to evaluate the anxiety, depression, hopelessness situations of the mothers of the children with cancer.

Material & methods: We have included the families of the children who diagnosed with cancer at the age of 0-18 years. The files that include clinical informations of the patients were scanned. The Parental Stress Scale (PSS) was used to evaluate the stress conditions of the mothers. The Beck Depression Scale (BDS) was used to assess the level of depression of the mothers. The Beck Hopelessness Scale (BHS) was used to assess the hopelessness of the mothers.

Results: A total of 24 (16 male and 8 female) children with a mean age of 9.18±6.32 years were enrolled in the study. When we look at the educational status of mothers; 8 mothers (33.3%) were did not go to school, 8 mothers (33.3%) were primary school graduates, 4 mothers (16.7%) were middle school graduates, 2 mothers (8.3%) were high school graduates and 2 (8.3%) were university graduates. The results of PSS score was 40.41±8.6; BDS score was 14.83±6.32, and BHS score was 29.58±1.67. Statistically significant correlation between PSS and BHS levels ($r=-0.615$; $p<0.05$) were found.

Conclusion: The parental stress is associated with mothers' hopelessness. Psychiatric counseling is highly recommended for the mothers.

Keywords: Stress, family, children, depression, hopelessness

Introduction

Cancer, which is one of the most challenging diseases of today, is a disease that raises multiple treatments and cause fear in the patients, relatives and society. The psychology of cancer patients and their relatives has an important role in the whole treatment process [1]. When we think of cancer as a life crisis, it affects individuals' daily living activities, roles and relationships directly. The development of negative feelings and thoughts is almost inevitable in patients with cancer or with possibility of having cancer [2].

Research on psychiatric disorders in cancer patients reveals that nearly half of these patients have a level of psychiatric disorder that requires diagnosis and treatment. From a psychiatric point of view, these diseases are; adjustment disorder, major depression, organic brain syndrome, personality disorders and anxiety disorder. Depressive spectrum diseases are the most common. Psycho-oncology (cancer psychology) has become increasingly important with advances in cancer treatment, and today it is spreading and developing as a part of the treatment [3]. Psycho-oncology is a discipline that investigates the psychological effects of cancer on the patient, family and treatment team, and provides psychological services to cancer patients [4]. Cancer causes a crisis in the patient's family as well as in the patient. Difficulties arise in the relationship between patient and family. These are necessary for the best and most healty relationship between the patient and her/his family:

free expression of emotions, have little conflicts and have more cooperation, patient compliance. In addition to cancer patients, families also often need psychological support and treatment. In summary, psychological treatment and support during and after the whole illness process will utilize this challenging process and increase the quality of life and treatment efficacy [5].

Our study aims to reveal the anxiety, depression and hopelessness of the mothers with cancer patients, to keep the motivation of family members and instinct to cope with the disease at high level, to obtain information theoretically, and if families need support, direct them to the necessary health institution.

Methods

Demographic informations of children and families who voluntarily agreed to participate in the study by scanning the our university hospital files containing personal and clinical informations.

Participants

Age, gender, diagnosis, age of diagnosis, treatment (type, frequency, duration, outcome), educational status, academic success, family history, symptom assessments, fatigue, pain, nausea, vomiting, sleep disorder, hair loss, infection, sleep disorder, cough, sputum, shortness of breath, neurological symptoms, accompanying and physical/clinical findings (weight, height, BMI) were comprised.

Inclusion criterias:

1. Have children with cancer diagnosis
2. Participating in the study voluntarily
3. Not having any neurological and / or musculoskeletal problems due to different reasons

Exclusion Criterias:

1. Have another neurologic and/or orthopedic disorder
2. Communication problems

Outcomes

1. Parental Stress Scale (PSS) was used to evaluate the stress status of the mothers. It was developed to evaluate the parental stress. PSS is an 18-item self-report scale that shows the positive aspects (emotional benefits, self-enrichment, personal development) and negative aspects (demands on resources, opportunity costs, and restrictions) of being a parent. The mothers who were attend the study is asked to answer whether they agree or disagree with the items that describe their typical relationship with their children. The answers for each item are given on a 5-point scale: 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree. The score ranged between 18-90, and 8 positive items were scored by the contrary. Higher scores indicate more stress [6].

2. Beck Depression Scale (BDS) was used to assess mothers' depression. BDS was formed by combining the symptoms of depression and depressive attitudes and behaviors of patients from the clinical field. The mothers were asked to select the statement which has best describe how they felt in the last week. This scale has 21 questions with multiple-choices and each answer has a value of 0 to 3 points. According to the distribution of points in the diagnosis of depression, 11-17 points indicate mild depression, 18-29 points indicate moderate depression, and 30-63 points indicate severe depression [7].

3. Beck Hopelessness Scale (BHS) was used to assess hopelessness of mothers. BHS measures the extent of the respondent's negative attitudes, or pessimism about the future. It is a 20-item scale with a true–false response format (nine items are keyed false, 11 true); each response is summed to give a severity rating from 0 to 20, with high scores indicating the presence of hopelessness [8].

Statistical Analysis

In the data analysis of the study, Package Statistical Package for Social Sciences (SPSS) Version 22.0 (SPSS inc. Chicago Province USA) statistics program was used. Demographic and clinical characteristics of the patients was analyzed by descriptive statistics, minimum, maximum values, mean and standard deviations were calculated. In all analyzes, $p < 0.05$ (bidirectional) values were considered statistically significant. "One sample Kolmogorov-Smirnov "test was used to determine whether the distribution of the data groups was normal in order to select the appropriate advanced statistical analyzes in the data analysis of the study. The relationship between the demographic characteristics of children and mothers (gender, age, etc.), and depression, anxiety and stress assessment results of mothers was examined with the Spearman Correlation Analysis.

Results

A total of 24 children (8 (33.3%) girls and 16 (66.7%) boys) and their mothers participated in the study. Eighteen of the children (75%) did not have any other disease associated with cancer. In terms of medical treatment; 18 (75%) children received chemotherapy only, 4 (16.7%) children received radiotherapy and chemotherapy, 2 (8.3%) children received chemotherapy and surgical treatment. Sixteen children (66.7%) received outpatient treatment; 8 (33.3%) received inpatient treatment. Children's demographic information (age, height, weight, BMI, etc.), clinical information (disease diagnosis, tumor / disease stage, diagnostic age, etc.) and information about their parents (age, educational status, etc.) were given in Table 1. It was learned that 6 (25%) of the mothers received professional psychological support during the treatment. The average results of the scales used to measure the psychological status of mothers are given in Table 2. There was a statistically significant relationship between the duration of treatment and psychological support of the children ($r = 0.759$; $p = 0.004$).

The correlations between the evaluation results of the children and their mothers are given in Table 3. There was a statistically significant relationship between BDS scores and nausea ($r = 0.606$; $p = 0.037$), vomiting ($r = 0.590$; $p = 0.043$), sleep disorders ($r = 0.660$; $p = 0.020$), infection ($r = 0.655$; $p = 0.021$), sputum ($r = 0.683$; $p = 0.014$) and neurological symptoms ($r = 0.595$; $p = 0.041$).

Table 1. Demographical and Clinical Characteritics of Children and Mothers.

	N	%
Tumor Term		
1.Term	6	25
3.Term	6	25
4.Term	12	50
Diagnosis		
Leukemia	2	8.3
Lymphoma	6	25
Brain Tumor	4	16.7
Kidney	2	8.3
Neuroblastoma	6	25
Sarcoma	4	16.7
Mothers' education		
Uneducated	8	33.3
Primary school	8	33.3
Secondary school	4	16.7
High school	2	8.3
College/University	2	8.3
Fathers' education		
Uneducated	2	8.3
Primary school	10	41.7
Secondary school	4	16.7
High school	4	16.7
College/University	4	16.7

N=Number; SD=Standart Deviation

	Mean	SD	Minimum	Maximum
Age (years)	9.18	6.32	3	18
Height (centimeter)	126.13	39.01	82	170
Weight (kilogram)	21.98	11.75	11	41
Body mass index (kg/m^2)	15.48	1.63	14	18
Diagnosis age (years)	5.25	5.37	1	15
Duration of medical treatment (months)	11.67	12.09	1	36
Symptoms (Visual Analog Scale)				
Fatigue	4.33	2.49	0	9
Nausea	3.67	3.23	0	10
Vomiting	2.83	3.43	0	10
Sleeping disorder	4.08	3.73	0	10
Hair loss	4.50	4.58	0	10
Pain	4.25	3.69	0	10
Infection	2.58	4.12	0	10
Malnutrition	5.08	3.85	0	10
Cough	2.92	3.97	0	10
Sputum	4	4.24	0	10
Dyspnea	3.08	3.94	0	9
Neurological problems	2.17	3.64	0	10
Mothers' age (years)	32.38	5.29	26	40
Fathers' age (years)	35.25	7.56	30	50

Table 2. The results of psychological states scales of children mothers'

	Mean	SD	Minimum	Maximum
Beck Depression Scale	14.83	6.32	5	24
Beck Hopelessness Scale	29.58	1.68	27	32
Parental Stress Scale	40.42	8.63	28	53

SD=Standart Deviation

Table 3. The relationships between results of scales

	Parental Stress Scale	
	z	p
Beck Depression Scale	0.351	0.263
Beck Hopelessness Scale	0.615	0.033*

** p < 0.05, statistically significant differences*

Discussion

The aim of this study was to evaluate the stress, depression and hopelessness of mothers who had children with cancer. Stress, depression and hopelessness were evaluated by scales, although they did not have any mental complaints. The scores of PSS used to measure stress status were found to be 40.42 ± 8.63. Although this result cannot be categorically classified, it shows that it has a proportional effect of 30%. According to the results of BDS (14.83 ± 6.32), which was used to determine the state of depression, mothers were found to have mild depression. According to the results of BHS, it was found that mothers were closer to hopelessness.

In the literature, depression and anxiety are highly prevalent not only in mothers and families but also in children with cancer. According to the results of our study, it is essential to evaluate both the child with cancer and his mother in detail. Others of children with cancer experience significant distress associated with their children's diagnosis and treatment [9].

Many studies have shown that children and adolescents with chronic illness, including cancer, have more mental problems. In addition, not only the conditions accompanying the disease, but the disorders that develop after the treatment are listed as high anxiety level, depression and anger attacks [10]. In our study, we

evaluated the hopelessness conditions associated with stress, depression and anxiety of mothers, not children. In future studies, there is a need for multidimensional research involving both the children with cancer and their mothers'.

It has been reported that as the duration of exacerbation of the diseases in children becomes more frequent and prolonged, children's fear and anxiety about death is increases. After the diagnosis of cancer, the life span of the children is prolonged with the developing treatments. The time for diagnosis of children is also prolonged. Children with cancer have higher anxiety levels than children without cancer. Depression levels in mothers of children with cancer are also different in mothers of children with and without chronic disease. However, with the progressive time, the difficulties and side effects of the treatment increase in children with cancer, death and future anxiety are experienced more and consequently, the increase in anxiety levels can be determined [11].

They emphasized that especially children with cancer, as well as their parents, were diagnosed with depression and anxiety disorder more frequently than mothers and fathers without chronic diseases. They reported that 1/3 of the mothers with children with leukemia had a mental disorder. Depression and anxiety levels in mothers are higher than those of fathers [12]. In addition, depression and anxiety levels differ from each other according to parental comparisons with / without chronic disease. These results support our social cultural characteristics. In mothers, especially when dealing with a child with chronic illness, burnout sufficiency is more common and therefore depression and anxiety levels may be higher. In the researches, it was emphasized that marital adjustment is good, socioeconomic level, having family support, parental education level, parental age, severity of the disease in the child, and whether it is fatal or not are effective in the anxiety and depression levels of the parents. Depression levels in mothers of children with cancer are higher than the parents of children with and without chronic disease [13].

Social stigmatization of cancer differs from other chronic diseases. Research shows that pessimism and helplessness are common among cancer attitudes and that cancer is perceived as a destruction. Today, although some types of cancer such as ALL, Wilms tumor can be treated, the idea that cancer is equivalent to death continues. In some other chronic diseases, which can be as lethal as life-threatening and can be fatal, such negative stigmatization is not observed. The negative attitudes of the society may be contributing to the higher levels of depression among children and mothers in the cancer group than those with other chronic diseases [14].

The low education level of families, lack of knowledge about the disease, wrong attitudes and problem solving capacity play a role in the anxiety and depression levels of sick children and their parents. Various methods are applied to reduce stress levels in children with cancer and their parents. It is reported that the general condition of children with cancer should be discussed separately from the patient. It is emphasized that only 25% of children with cancer can result in death and therefore there should be no definitive interpretation of the course of illness [15]. Two years after the diagnosis of 52 children and parents of children with cancer, psychosocial examination of the children and parents did not experience significant psychosocial problems, and during the treatment of adequate and compatible patient-doctor-parent relationship may play a protective role in the family and children's mental problems they emphasized. In addition, group therapies for mothers-fathers and siblings and children with cancer have been reported to be particularly useful in sharing emotions and finding the ability to cope with the situation [16].

Limitations of the Study

The limitations of our study were the small sample size and the evaluation of mothers only. In the evaluation, scales with separate child-parent modules and easy to use clinically are needed. Although the number of children in the sample group in our study was not sufficient to make a definitive comment on the mental problems experienced in children with chronic illnesses and their families, we think that children with chronic illnesses and their families are more stressed.

Further studies with larger sample groups and evaluation of more detailed sociodemographic data will shed more light on this issue.

Conclusion

As a result, adequate communication and support should be provided between the departments in the hospital so that children with fatal illnesses such as cancer and their families can cope more easily with stress better adapt to the disease, and be least affected mentally. The entire family should be given the necessary psychiatric support.

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Original Article
DOI: 10.5455/amaj.2021.01.003

Comparison of the Cost of Treating Synthetic Cannabinoids and other Illicit Substances to the Healthcare System in the Emergency Department

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Objective: In this study, we aim to report the cost of drug use related presentations to the healthcare system and compare synthetic cannabinoids (SC) and other illicit drugs (OID) in terms of the financial burden they created as individual groups.

Material & methods: This is a retrospective study which was held in University of Health Sciences Umraniye Education and Research Hospital Department of Emergency Medicine between 01.09.2015 – 31.08.2016. Patient files were surveyed according to predetermined ICD codeswith substance use related presentations and the expenses were analyzed for diagnotics, treatment and as the total cost for both SC and OID patient groups.

Results: Mean age of 721 patients who were included in our study was 27.20 ±7.15 (95% CI: 26.68 – 27.74). 667 (96.9%) were male. Median total cost of emergency department (ED)attendances of the patients who used SCs was 103.41 (83.51-153.49) TL and 112.95 (90.12-160.73) TL for OID group.

Conclusion: Presentations to ED with illicit drug use and drug related complications contribute immensely to health expenses. More prospective and long term studies are necessary to determine the true financial impact of these presentations to ED. This may create awareness in both public and policy makers to implement actions against drug use.

Keywords: Synthetic cannabinoids, illicit drugs, substance abuse, healtcare expenses, cost of treatment

Introduction

Psychoactive drugs are being introduced in an increasing trend to the market in recent years. Synthetic cannabinoids (SC) make an important percentage of these drugs. (1) Acute intoxication cases secondary to drug abuse, is one of the most common problems in the emergency department (ED) which increased significantly over the last decade. Diagnostic tests to rule out other causes or identify potential life-threatening effects, symptomatic treatment and prolonged observation in this patient group effects the workload of ED significantly but also puts a financial burden to healthcare system. To the best of our knowledge, this aspect of substance abuse is understudied in current literature and there is no clear data on the effect of SC use on the healthcare costs, especially in Turkey.

SC have been marketed as herbal incense, or "herbal smoking blends", and sold under common names like K2, Spice and Synthetic Marijuana. In our study, we identified such as cocaine, DMT, heroin, marijuana, ecstasy, opioids and methamphetamine are OID's.

Material & Methods

This is a retrospective study which was held in University of Health Sciences Umraniye Education and Research Hospital Department of Emergency Medicine between 01.09.2015 – 31.08.2016. Our center is a 836-bed tertiary referral center with a patient volume of 590.000/year (430.000 adults) (2).

Patient records with the following ICD

codes were surveyed: F12. Cannabis related disorders; Z72.2 Drug use; Y57.8 Drug and other medication use related adverse effects –other; Y57.9 Drug and other medication use related adverse effects –unspecified. Patients with other ICD codes, who were under 18 years of age, who self-discharged against medical advice and declined treatment were excluded. As a result, 927 patient files were surveyed and a total of 459 records were included in our study. (Figure 1)

The patients or, friends or relatives of the patients disclosed the type of illicit drug they've used. No urine or blood tests were performed to confirm their statement, as it was not the routine procedure in our healthcare setting.

Patients' age, sex, their way of presentation (by Emergency Mobile Systems (EMS) or other ways), outcome and the cost of their treatment in Turkish Lira (TL) were recorded. To make our data easier to comprehend we used United States Dollars (USD) to report the costs. Exchange rate was 2.93 when the analysis were made (1 USD = 2.93 TL). (3)

Statistics Package for Social Sciences (SPSS) for Windows®23.0 (IBM Corporation, Chicago, Illinois) were used for statistical analyses. In order to define continuous variables, descriptive statistics (average, standard deviation, minimum, median, maximum) are used. The relation among the categorical variables is analyzed with Mann Whitney U, Chi-squre test and/or Fisher exact test when it is required. P values less than 0,05 were considered statistically significant and confidence interval criterion is determined as %95.

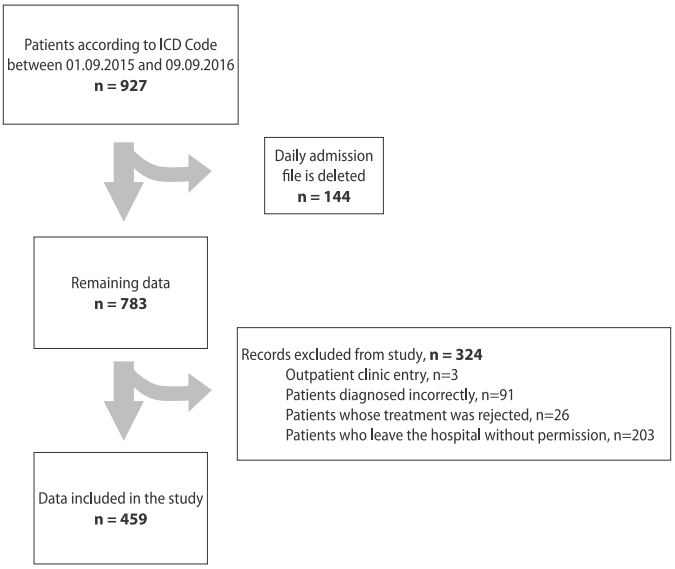


Figure 1. Schematic diagram of the study enrollment

Results

459 patients were included in our study. 442 (96.3%) were male. Mean age of patients were 27.28 ± 7.33 (95% CI: 26.60 –27.95). 306/459 patients (66.7%) used SC. There was no statistical difference in the age of patients in SC and OID groups [mean age 27.25 ± 7.27 (95% CI: 26.43 – 28.14 and 27.32 ± 7.48 (95% CI: 26.18 – 28.50), respectively, p>0.05] (Table 1).

Only 6 patients (1.3%) had chronic conditions and 19 (4.1%) reported alcohol use along with drugs. 223/327 (72.8%) patients who used SC and 104/152 (67.9%) who used OID were brought to hospital by ambulance. 5.0% (n=23) had trauma, 16 used SC among those 23 patients.

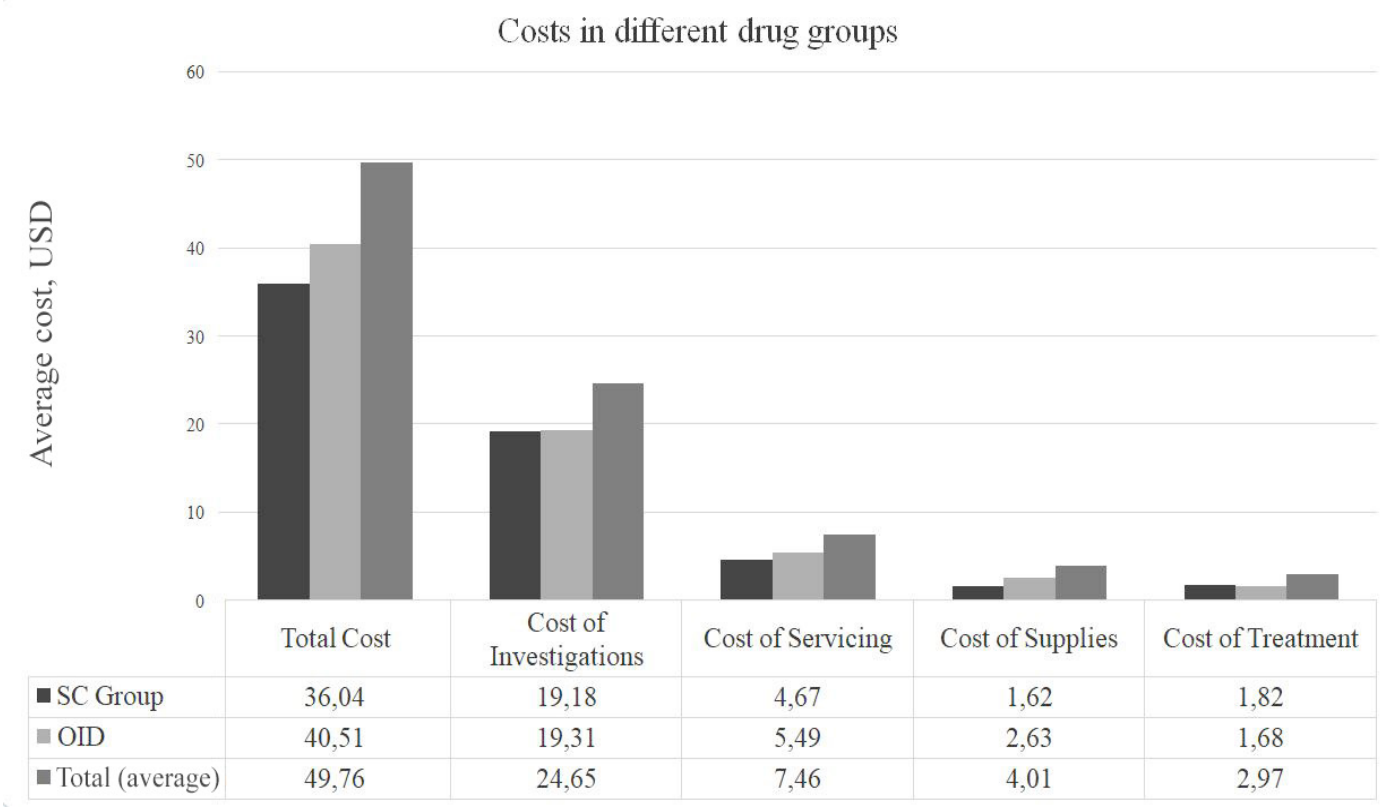
109/153 patients (71.2%) who used OID needed radiological imaging and 6 (3.9%) were consulted to other specialties while 81 (66.7%) had imaging and 12 (3.9%) were consulted in SC group.

Two patients from both groups needed endotracheal intubation to protect their airway during their course of stay in ED. 445 patients (96,94%) were discharged, and 11 patients (2,40%) needed intensive care unit admission and 3 (0,65%) were admitted under other specialties. The average cost to health care system by the patients who used OID was 40,51 (31,70-61,36) USD and the average cost of the patients who used SC was 36,04 (28,46-53,36) USD. (Figure 2)

According to our study, we found that there was a statistically significant difference between the OID group and the SC group

Table 1. Descriptive data of patients who used synthetic cannabinoids and other illicit drugs. SC=Synthetic cannabinoids, OID=Other illicit drugs, EMC= Emergency Medical Service, ICU=Intensive care unit.

	SC group	OID group	Total
Patients	n = 306 (66,7 %)	n = 153 (%33,3)	n = 459
Age	27,25 ± 7,27 (95% CI: 26,43 – 28,14)	27,32 ± 7,48 (95% CI: 26,18–28,50)	27,28±7,33 (95% CI: 26,60–27,95)
Male	n = 295	n = 147	n = 442
Female	n = 11	n = 6	n = 17
Brought by EMS	n = 223	n = 104	n = 327
Came in other ways	n = 83	n = 49	n = 132
Discharged	n = 297	n = 148	n = 445
Admitted to ward	n = 3	n = 0	n = 3
Admitted to ICU	n = 6	n = 5	n = 11



	Total Cost	Cost of Investigations	Cost of Servicing	Cost of Supplies	Cost of Treatment
SC Group	36,04	19,18	4,67	1,62	1,82
OID	40,51	19,31	5,49	2,63	1,68
Total (average)	49,76	24,65	7,46	4,01	2,97

Figure 2. Costs in different drug groups. SC=Syhthetic cannabinoids, OID= Other Illicit Drugs.

in terms of total costs and costs of investigations. (Mann-Whitney U test, p=0,02 and p=0,014, respectively). No significant difference was found among the patient groups in terms of cost of servicing, of medical supplies, of treatment. (According to the alpha level of 0,005, Mann-Whitney U test, p=0,225, p=0,050, p=0,458).

Discussion

Costs of emergency service constitute a substantial part of the health expenses. (4) Drug related presentations increase both the workload and the health expenses of ED, causing indirect loss of workforce, and very likely contributing to staff burn-out and cause more financial burden that is nearly impossible to determine. SCs are reported to be a common cause in drug related presentations and they have a lot of adverse effects including death (5). The main reasons behind their popularity amongst drug users are their accessibility and reasonably cheaper price in the street (6). Our study confirms that SCs are responsible for the majority of the drug related presentations to ED. We believe this was caused by the low socioeconomic status of our patient population. A review by Loeffler et al. reported that Cannabinoids are more frequently used by young adults as well as the other drugs. Drug addiction and recreational drug use including SCs are more commonly observed in males. Socio-economic and cultural reasons are believed to be the reason for this phenomenon. (7) As discussed above, our data was compatible with the literature in terms of the socio-economic status, age and sex of patients with drug related presentations (8,9).

Government expenditures on the fight against drugs in Turkey were reported to be 127,180,397 USD in 2011 and 253,770,275 USD in 2013 (9) which shows a gradual increase in just 2 years. Emergency healthcare costs associated with drug use in USA was reported as 2,2 billion USD per year in 2011 (10). Unfortunately, we failed to identify any further research that shows similar data for Turkey. We believe by identifying the actual cost of drug related presentations to ED, law and policy makers may be influenced to focus their attention to prevent substance use rather than to treat its complications. For this reason, we believe our study fills the deficit regarding the emergency service costs of the patients who has drug related presentations.

Another interesting finding is that the use of OID was related with significantly higher costs compared to the use of SC even though the average costs are similar to each other. SCs related presentations are known to have more severe and long-lasting clinical symptoms (11), however since their symptoms are easily recognizable, we can argue that they need less diagnostic studies compared to OIDs as the main difference was in the cost of diagnostics, explaining the difference in cost.

It is known that SCs can cause a variety of clinical presentations because they are manufactured in a non-standard way by different suppliers and their contents change frequently. SCs show their effects via CB1 and CB2 receptors. CB1 receptors take part in glutamate and GABA neurotransmissions. These receptors play an active role in anxiety, psychoactive reactions, analgesia, audio-visual perception changes, motor function deficiencies, time perception and memory problems (12). The

affinity of SC to CB1 receptors and the strength of their affect on those receptors depends on their content, therefore the clinical presentation may be different with different batches of SCs (13-15).We believe the low potency of the SCs in the drug market during the period of our study may have caused their cost to be less than OIDs. More prospective, long-term studies are needed to objectively identify and analyze the true cost of illicit drug use to the emergency service.

Conclusion

Presentations to ED with illicit drug use and drug related complications contribute immensely to health expenses. More prospective and long-term studies are necessary to determine the true financial impact of these presentations to ED. This may create awareness in both public and policy makers to implement actions against drug use.

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Review Article
DOI: 10.5455/amaj.2021.01.004

Dental Procedures During the COVID-19 Outbreak: Algorithms and Recommendations

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World Health Organization described novel coronavirus disease (COVID-19) as a pandemic disease on 11th March, 2020. Dentists are a high-risk group due to the inability to provide the necessary social distance for contamination and the possibility of transmission of SARS-CoV-2 responsible for COVID-19 through aerosols and droplets during procedures. In this review, general principles of prevention of contamination, the limits of emergency treatment of dentistry, evaluation of transmission risk of COVID-19 in dentistry and workflow in dental hospitals and clinics.

Keywords: COVID-19, SARS –CoV-2, pandemic, virus contamination, dentistry.

Introduction

In late 2019, a new disease was detected in Wuhan, China [1]. The World Health Organization (WHO) added a new type of disease to the guide by naming this disease Coronavirus (COVID-19) on November 12, 2020 [2]. It has been confirmed that the etiological factor of the disease is the Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing the respiratory illness with symptoms of dry cough, fever, shortness of breath, and fatigue [3]. Looking at the prevalence of clinical cases, it is seen that the virus spread to all countries in a short time [4]. Therefore, WHO has declared COVID-19 a pandemic [5]. As a result of the effects of this virus, the American Dental Association (ADA) recommended on March 16, 2020 that routine dental treatments be delayed for a while and only emergency examinations be carried out [25]. Accordingly, ADA has classified emergency dental procedures as follows:

1) Interventions to eliminate uncontrolled bleeding, severe pain and inflammatory conditions that pose a potential serious health risk;

2) Treatments for swelling of the face/mouth, dental trauma, difficulty in opening jaw, and persisting ulcers [26].

COVID-19 is mainly transmitted by respiration, therefore, dental treatments that cause aerosol formation are of additional importance [25]. Thus, the present article evaluated the disease and protection procedures with the protocol need for the actual implementation of dental procedures during and after the pandemic. The protocols in this article cover the dental treatment rules that should be applied to patients in dental clinics during this critical period. The aim is to prevent contamination of this virus and protect dentists and dental assistants while providing emergency treatments to patients.

COVID-19 disease, clinical symptoms and infection routes

Coronaviruses have been shown to be RNA viruses with a single nucleocapsid protein and high mutational properties [6]. COVID-19 has dimensions in the range of 60-140 nanometers and is characterized by its sensitivity to ultraviolet rays and heat. Due to the lipid coating consisting of a double layer, this virus is sensitive to 75% ethanol and chlorine disinfectants. Coronaviruses are a large family of zoonotic viruses that can cause severe illnesses in humans, such as SARS-CoV in 2002 and Middle East Respiratory Syndrome (MERS-CoV) in 2012, in addition to symptoms such as the

common cold [7](Figure-1).

The incubation period of the virus is estimated to be between 2 and 14 days and it has also been reported that this period may extend up to 24 days [8]. The most common symptoms of COVID-19 are fever, weakness, dry cough, dyspnea, myalgia, and diarrhea [9]. In most patients, the disease progresses with mild symptoms and can result in death from high fever, pneumonia, acute respiratory distress syndrome (ARDS) and renal failure. While most infected individuals experience mild to moderate respiratory symptoms, severe respiratory syndrome occurs in 5 to 10% of infected individuals [10]. COVID-19 is practically spread by asymptomatic infected individuals. The 0.2% COVID-19 mortality rate in young people increases with age and the presence of systemic disease (comorbidity) [11]. Laboratory tests for the disease show leukopenia, leukocytosis, and lymphopenia [9, 12]. In the chest computed tomography (CT) examination of the disease, consolidation anomalies (increased fluid in the alveoli) and / or only opacification (ground glass appearance) are observed on the background of viral pneumonia [13]. It has been shown that elderly individuals with a weakened immune system and chronic systemic diseases are more likely to be contaminated with SARS-CoV-2 [9]. Although it is not possible to determine the exact number of clinical deaths (CFR) in the world, it is estimated that there are 4.5% deaths in this disease. The death toll is lower than the Azerbaijan Republic Medical Institute and the Operational Headquarters affiliated with the Council of Ministers. This is because our state has proven to be positively correlated with the correct isolation measures given ahead of time.

The virus attaches to the ACE2 receptor in respiratory system cells. Therefore, patients using cardiac drugs containing ACE2 inhibitors should be more careful. Even if the infected cells die, millions of copies of the RNA complex can remain in the cells. In severe cases, the immune system reacts autogenously, severely damaging both the virus and our own cells, leading to death from acute pneumonia. This coronavirus type enters our body through the nose, mouth and cornea of the eyes and settles in the upper respiratory tract and lungs. The infection spreads through coughing, sneezing and direct drip over short distances. Indirectly, when we come into contact with infected surfaces, we can be contaminated by touching our nose, mouth and eyes with our hands. In addition, the virus has been seen to spread up to 8 meters by coughing and sneezing [27]. According to experiments, the virus lives in the environment in aerosol (air drop) droplets for at least 3 hours, and the presence of the virus has been observed even in blood and feces [14]. The virus can stay on inanimate surfaces such as metal, glass and plastic for up to 9 days, depending on surface properties, ambient temperature and humidity [15].

The situation of the COVID-19 pandemic in the world and in the Republic of Azerbaijan

On February 28, 2020, the Operational Headquarters of the Cabinet of Ministers of the Republic of Azerbaijan confirmed the emergence of the first coronavirus (COVID-19) infection in Azerbaijan [28]. REACT Co-19 project, the hospital and the

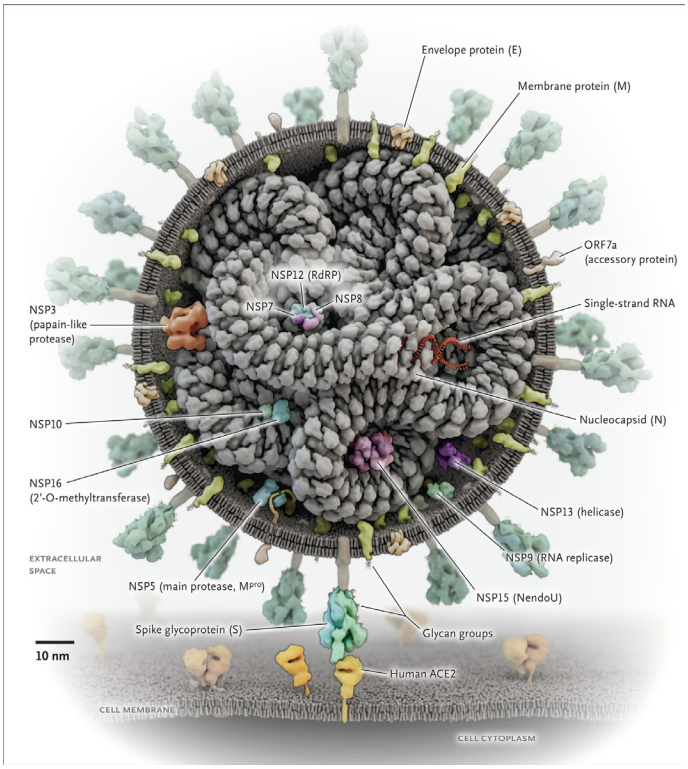

Figure 1. Schematic description of the SARS-CoV-2 virus structure [16].

planned creation of full-fledged branch team, working citizens of the Republic of Azerbaijan and the Republic of Turkey have brought to the country fight the pandemic is provided.

As of May 25, 2020, according to WHO data, a total of 5,304,772 COVID-19 cases and 342,049 deaths were detected in 227 countries worldwide. At this time, 4122 COVID-19 patients were identified in the Republic of Azerbaijan, only 49 deaths were recorded [29]. Clinical symptoms and radiographic findings are similar to other symptoms of respiratory viral infection and make early diagnosis of COVID-19 patients difficult. The fact that most cases are in the development stage of the disease leads to a higher than expected mortality rate. The incidence-mortality rate is expected to decrease further as more tests are performed on mild and asymptomatic infections. However, this low mortality should not be considered as a risk of common disease [17].

Contamination risks with COVID-19 infection in dental clinics and hospitals

Considering the pandemic process, doctors, resuscitation workers, dentists, paramedics, nurses, landlords, truckers are in the most risky work areas. Especially ophthalmologists, ear and throat specialists and dentists are at high risk due to close contact with COVID-19 positive asymptomatic patients [30]. Dentists and patients may be exposed to oral and respiratory viruses during dental treatment, become contaminated by pathological microorganisms and become carriers of these microorganisms. Inhalation of aerosols and airborne particles in dental procedures is considered as a high risk of contamination

as bronchoscopy [31]. COVID-19 transmission has been shown to occur in dental clinical practice because patients do not know whether they are infected or hide their disease during the incubation period [18]. Thus, in dental procedures, it has been proven that patients have a droplet infection that is ejected from the oral cavity and that aerosols can spread this infection over long distances [19]. SARS-CoV-2 can be transmitted directly or indirectly through speech, coughing, sneezing and saliva. Studies have shown that the saliva of infected people preserves the viability of the virus [20]. Infection routes during dental procedures for SARS-CoV-2 infection can be grouped under the following headings: 1) insufficient social distance (less than 1 meter); 2) inhalation secretions and airborne fluids, contact with nasal and eye mucosa; 3) direct contact with blood, oral fluid and other used means; 4) exposure to droplets and / wow aerosols caused by infected persons during speech and coughing [9].

Protocol for Preventive Measures in Dental Treatments During the COVID-19 Pandemic

Even if the body temperatures of the patients and their accompanying persons are measured with a digital infrared thermometer at the entrance to the clinic, these individuals may be asymptomatic. Therefore, asymptomatic and suspicious patients should be distinguished. To do this, dentists need to know how SARS-CoV-2 spreads, the symptoms of contaminated patients, and practical preventive measures [21]. The protocol on preventive measures prepared for hospitals and clinics by the Ministry of Health of the Republic of Turkey Coronavirus Scientific Committee is given in the table below (Table 1) [32].

Remote Evaluation

In order to reduce direct contact, it has been shown that taking an anamnesis by phone and online recording is useful in evaluating persons suspected of having SARS-CoV-2 [33]. In this context, the Republic of Turkey, China, many mobile application has been developed to detect persons in contact with people in Israel and the United States. The body temperature of the patients and their attendants should be measured with the infrared forehead thermometer. In addition to COVID-19, dental abscesses, periapical cysts and pericoronitis should not be ignored in any patient with high fever. Before ddental procedure, a careful history should be taken and treatment consent forms should be signed after all questions (related to SARS-CoV-2) are answered as "no". Triage protocols (selection and classification according to the importance of the patient's emergency medical care) can be created according to the severity of the patients' complaints. This is necessary to protect both medical personnel and the patient. Clinical staff should also actively follow the rules applicable to patients (non-contact temperature measurement at entry, social distance and mask). It is important to identify elderly individuals with a history of chronic disease and weakened immunity. These individuals increase the risk of infection for both themselves and their patients [33].

Personal hygiene

The WHO stated that washing hands with soap for at least 20 seconds reduces the risk of infection. Dentists should be careful not to touch their face and eyes [21]. Hand washing should be done carefully after dental procedures and when changing protective overalls. The SARS-CoV-2 virus was also inactive with the use of 752% ethanol for 30 minutes in 56 ° C water [22].

Personal protective equipment should include long sleeved disposable gowns, disposable hats, surgical face masks, face shields, goggles, and gloves. When personal protective equipment is put on and taken off, it should be listed separately as hat, apron, mask, goggles, face protection and gloves (Figure-2). Gloves should be changed regularly as fluid leaks during long procedures. The entire eye part should be protected from the top, bottom and sides with closed glasses. N-95 and FFP3 masks should be worn during all procedures that cause airborne droplets [18]. Unfortunately, finding N95 masks today is very

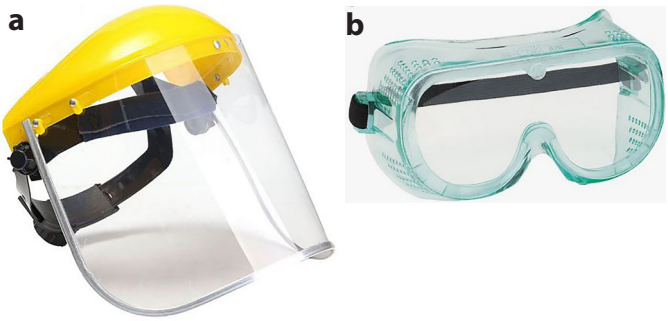

Figure 2. a. Face shield, **b.** Vacuum goggles.

Table 1. Protocol of preventive measures to be taken during the COVID-19 pandemic in dental area.

Place	Person	Procedure	Prevention
Waiting room	Health-care worker	Remote evaluation (non-oral)	Minimum 1 m distance to the patient. No need for protective clothing (mask should be worn if distance is not maintained).
	Patients with symptoms	In every procedure	A distance of 1 m must be maintained. Patient should wear a mask. Non-emergency services should be postponed.
Dental clinic	Medical staff and everyone in the room	Dental procedures	0.91 N95 or FFP2 or equivalent mask,gloves, goggles, face shield, aprons, and bonnets.

Figure 2. a. N95, **b.** FFP2, **c.** FFP3

difficult and expensive for us. N95 masks provide at least 95% of 0.3 micron particles, FFP2 masks 94% and FFP3 99% filtration (Figure-3). Dental clinics should be ventilated and disinfected before and after admission. Medical personnel should remove the protective equipment in the room where the procedure is performed and use a surgical mask outside the room. A disposable protective cover can be used on the feet. After each patient, glasses and face masks should be cleaned and wiped with soapy water and a disinfectant containing at least 70% alcohol.

During dental procedures, physician precautions should be taken in two different stages against the possibility of the spread of SARS-CoV-2 infection:

Basic protective measures: Disposable headgear, disposable surgical mask + N95 or FFP3, white coating, protective goggles, face protection caps, use of disposable latex or nitrile gloves.

Enhanced protective measures: The use of supplemental disposable insulating clothing (overalls) and / or work gowns should be considered.

The order and importance of dental procedures

It is recommended to use extraoral (oral) methods (panoramic x-ray and volumetric tomography-CBCT) among the x-ray examination methods used for diagnosis at the beginning of dental procedures [18]. Procedures for patients with cardiovascular disease should begin with appropriate consultation and antibiotics for endocarditis prevention according to the protocol of the American Heart Association. Before examination and treatment, patients should be given 1% hydrogen peroxide solution and 0.2% povidone-iodine solution to gargle [21]. During the COVID-19 pandemic, limited use of local anesthetics with a strong vasoconstrictive effect is recommended [23]. The use of rubberdam in endodontic treatments may facilitate the absorption of air droplets by an aspirator without spreading over a large area and being swallowed by the patient. There are no restrictions on the use of postoperative antibiotics in accordance with the protocols. Non-steroidal anti-inflammatory drugs (NSAIDs) have been reported to be prescribed other pain relievers as they cause immunosuppression and exacerbate respiratory problems [24]. The use of NaOCL (sodium hypochlorite) solution in endodontic therapy has been shown to be successful as it successfully eradicates COVID-19 infection. Furthermore, the later stages of pre-existing endodontic therapy may be delayed according to treatment. Vital pulp tests should be performed in patients with endo-perio lesions and periodontal consultation should be provided. Teeth with suspicious prognosis and less likely to respond to treatment should be extracted (34).

Ultrasonic cleaning of dental calculus should be delayed due to the spread of airborne infections in the area, and patients should be advised to follow oral hygiene rules during the COVID-19 outbreak. Cleaning of dental tartar should be done with hand tools such as SRP (scaling and root planning).

Surgical procedures such as mouth abscess and periapical cyst treatment should not be delayed and should be treated according to protocols. Perio-plastic surgery methods, procedures such as dental implants and bone augmentation may be postponed.

Filling can be applied to broken teeth due to trauma. Although splinting of teeth that are completely removed from the alveolar socket has been recommended, replantation is not recommended [18].

In prosthetic procedures, disinfection should be taken into consideration in the necessary measurement and transportation. Additionaly, high-speed tools should not be used as much as possible (23).

Conclusion

Today, all features of the SARS-CoV-2 infection are analyzed in depth. In the field of dentistry, dentists should create their work plans based on this information and adapt their service protocols according to the pandemic duration. Dentists should acquire equipment with strong aspiration characteristics to protect both medical staff and patients from contamination.

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Review Article
DOI: 10.5455/amaj.2021.01.005

Azerbaijan National Growth Charts for Children and Adolescents from Birth to 16 Years

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Objective: Establish Azerbaijan national growth charts for children and adolescents, and conduct a comparative analysis of local growth references with the growth standards of the World Health Organization (WHO), The Centers for Disease Control and Prevention (CDC), and Turkish children growth references.

Material & methods: This study included the collection of anthropometric measurements from birth to 16 years based on a mixed longitudinal and cross-sectional study. Cole's LMS statistical method was used to smooth growth curves and create age percentiles.

Results: A total of 19280 weight and height data (47.8% of which were girls), and 12246 were head circumference data (46.8% of which were girls) were analyzed; and national percentiles diagrams for weight-for-age and height-for-age from birth to 16 years, head circumference-for-age from birth to 3 years, and BMI-for-age from 2 to 16 years were composed. As a result, a comparative analysis was carried out.

Conclusion: The revealed high BMI from local children and adolescents is an alarming sign, as being overweight in childhood can have serious consequences in adulthood.

Keywords: Body Mass Index, growth charts, head circumference, height, weight.

Introduction

Growth charts are an important tool for assessing and monitoring the growth of children, both in pediatric practice and in public health organizations [1,2]. Growth charts are presented in the form of curves and tables to help visualize anthropometric data [3]. They provide an opportunity to assess the state of health and nutrition at both the individual and population levels [4]. Growth charts have come a long way in 200 years, and they represent an impressive synthesis of anthropometry, statistical summary, and chart design [5]. Growth charts are the standard accepted way to monitor growth, diagnose disease, and monitor improvement [6]. Using these, specialists can compare the anthropometric parameters of one child with the parameters of a large group of children of the same age and gender [7]. Early diagnosis of deviations from the norm makes it possible for specialists to timely identify the presence of diseases, problems with food, lifestyle, or care; predisposition to pathological conditions [8]. Since there are no national growth charts in Azerbaijan, local specialists use Turkish growth charts in their practice [9], given the proximity of peoples and WHO growth standards [2,10]. WHO growth standards (Multicenter Team, WHO Growth Survey 2006) for children between 0 and 5 years, based on measurements of children from six countries, were developed under the assumption that children who are raised under good conditions grow similarly in the first years of their lives irrespective of their genetic predisposition [11]. These standards were recommended for international use [2]. Also, they had endorsed by over 150 countries of the world and became an integral part of their growth assessment [5].

The reference values proposed for use in children older than 5 years are based on the revised version of the National Center for Health Statistics (NCHS) that has been in use in the United States since 1977. These latter charts are known as the 2000 Centers for Disease Control (CDC) Growth Charts [2,7]. Thus the WHO references for older children were developed by the merging and smooth transition of these data [7]. However, some countries have their national growth charts [9,12,13,14,15,16,17,18,19,20]. As there still may be differences in healthy growth among populations that are explained by genetic, ecological, nutritional, or other differences between populations. The Azerbaijan National Growth Study was held to provide comprehensive data on the growth pattern of local children and to compare them with currently used in the country the Turkish/WHO/CDC reference values.

Materials and methods

The study was conducted based on the pediatric department of the Baku Medical Plaza from 2015 to 2020. The study has used a combination of longitudinal with cross-sectional research sampling methods based on age and gender. Were collected anthropometric measurements from children aged 0-16 years. A total of 19280 weight and height data analyzed, of which 9221 were girls (47.8%) and 10059 were boys (52.2%); and 12246 were head circumference data analyzed, of which 5731were girls (46.8%) and 6515 were boys (53.2%). The selection criteria for the participants in this study was close to the criteria of the MGRS [21]. Healthy full-term babies (born to an Azerbaijani father) were included in the research, from singleton pregnancy, without chronic and congenital health abnormalities that could affect their growth. Children grew up in a social-economic and ecological supportive environment where factors that negatively affect growth were minimized, including poor nutrition and infections. Mothers adhered to a healthy lifestyle, for example, there was no smoking. All criteria of the MGRS also were adhered to regarding breastfeeding [22], because it was considered as a physiological norm: 1) exclusive or predominant breastfeeding for at least 4month; 2) introduction of complementary foods between 4 and 6month; and 3) partial breastfeeding to be continued up to at least 12month.

Although the study was based on one clinic, not only all 12 districts (raion) of Baku were covered: Binagadi, Garadagh, Khatai, Khazar, Narimanov, Nasimi, Nizami, Pirallahy, Sabail, Sabunchu, Surakhany, Yasamal; also other cities and districts of Azerbaijan: Shirvan, Ganja, Lankaran, Mingachevir, Naftalan, Neftchala, Shaki, Sumqayit, Yevlakh, Nakhchivan, Khirdalan, Masally, Barda, Beylagan, Balakan, Hajiqabul, Imishli, Ismayilli, Kurdamir, Qabala, Qakh, Qazakh, Quba, Qusar, Saatly, Sabirabad, Salyan, Shamakhi, Shamkir , Shabran, Tovuz, Ujar, Khachmaz, Zaqatala, Agstafa, Agsu, Aghjabadi, Gadabay, Yardimli. This did possible because our medical center popular among the local population and accepts pregnant women and women in labor from as all over the city and also from all parts of Azerbaijan. Infant data were taken from the neonatal unit (weight, length, head circumference). A larger part of the children born in our center continued to undergo scheduled pediatric examinations with vaccinations according to the calendar in the children's department of our center. Mentioned above created an opportunity for our team to conduct a longitudinal examination of these children. Healthy children with the appropriate criteria, which were born in other clinics. However, who passed the examination at our center one or more times, also participated in the study. In the pediatric unit, at each visit, anthropometric measurements were collected from each child.

5 trained nurses performed all measurements, using standard equipment and methods [21,23,24]. The instruments used for the measurements were checked at the beginning of each day as the equipment required precise calibration. Electronic measuring devices were checked once a month for serviceability and accuracy. The medical personnel received training every six months. Differences within and between observers were also assessed by calculating the technical measurement uncertainty.

Weighing of infants was carried out without clothes on electronic scales with a Seca-232 height rod with restraints for the head and legs. With this kit, you can quickly and accurately determine the weight and height of the baby at the same time. Children from 1.5-2 years old were measured standing without shoes and outerwear, without jewelry on their heads, using medical electronic scales with a Tcs-200-Rt height rod or Wolf electronic floor scales and a wall height rod, installed at right angles to the level floor and leaning against a straight vertical plane. When measuring growth, the back of the head, shoulder blades, buttocks, calves, and heels should have touched a vertical plane. The child's body weight was recorded with an accuracy of 0.1 kg, the child's body length in centimeters with an accuracy of 0.1 cm. When measuring the height of a child under 2 years old in a standing position, 0.7 cm was added to the result obtained to obtain the length body (according to the WHO recommendation, the height in the standing position is less than the length of the body in the lying position by about 0.7 cm).

Head circumference was measured with a flexible, non-stretching centimeter measuring tape. For maximum accuracy when measuring, children had to look straight ahead. A measuring tape was applied to the patient's head along with the landmarks: behind the occipital protuberance, in front of the super ciliary arches. The measurements were carried out twice taking into account the average value.

This study has fulfilled all the ethical approach from every stage of the research and was has been approved by the local ethical committee. Collection of anthropometric in both younger and older age groups was a part of medical examination.

Data for the first year of birth were collected monthly (0 (data obtained from hospitals), 0.5 to <1.5, ≥1.5 to <2.5, and so on.), from a year to three years every three months (eg.14.5 to <15.5, 17.5 to <18,5 and so on.), from three to six years every 6 months (eg.35.5 to <36.5, 41.5 to <42.5 and so on.), from 6 to 16 years, once a year. The age intervals in older group were ≥5.5 to <6.5, ≥6.5 to <7.5, ≥7.5 to <8.5, ≥8.5 to <9.5, ≥9.5 to <10.5, ≥10.5 to <11.5, ≥11.5 to <12.5, ≥12.5 to <13.5, ≥13.5 to <14.5, ≥14.5 to <15.5, ≥15.5 to <16.5. Measurements were presented by rounding. For example, for the age of 2 months and <15 days was expressed as 2 months; 2 months and >15 days was expressed as

3month; a height of 60.52 cm as 60,5 cm. Age was determined to the nearest month using the date of birth shown on the birth certificates before the date of measurement. In case of early interruption of breastfeeding or diagnosis of any chronic or congenital diseases and any disorders in the examined children, they were excluded from the study. Children from multiple pregnancies, children born before 37 weeks of pregnancy also were excluded. Children could participate in study 1 or more times, on average 8 +/-5 children under 5 years old and 3 +/-2 in older children. So how, about 80% of the examined children in our clinic were children of preschool age, for the study of the older group, it was decided to connect secondary schools and collect anthropometric measurements for children and adolescents 6 to 16 years. In the older group, from each examined was collected 3 + _2 data. Children underwent a questionnaire survey: about passport data, a short family history, the presence or absence of chronic health problems. The study participants were from socially well to do families, whose parents mostly had higher education. The physical assessment of secondary school students was carried out in the school doctor's office. Each student had a health card, and anthropometric measurements were entered there. Personal data, health status, presence or absence of chronic health problems were also recorded in this card. The weighing was carried out without shoes and outerwear on an electronic scale, height was measured while standing. Although the younger group (children until five years) covered most of the cities and regions of Azerbaijan, the older group (children from 6 to 16 years) included generally children and adolescents, who live in Baku. Considering that the capital has received immigrants from all over the country for many years, the mixed composition population of this city can be considered quite representative for this research. The collected values of anthropometric data were grouped by gender and age. Statistical reporting was carried out using the Microsoft Office Excel (2010) software package by the method of variation statistics. Data was cross-analyzed. The LMS method was used to smooth growth curves with estimates of L, M, and S parameters [25,26]. The growth model LMS by Cole &Green was used to help create the growth charts [27]. This method assumes that the measurement at each age can be transformed to a normal distribution using a Box-Cox transformation [28], and just three parameters, the Box-Cox power λ, the median μ, and the coefficient of variation σ, summaries the distribution. For the construction of LMS scores for our study was used LMS Chart Maker Pro version 2.54 (Harlow Healthcare, Tyne and Wear, United Kingdom). The resulting models were checked for the goodness of fit using the detrended Q-Q plot, Q Tests, and worm plots.

Results

We present national percentiles diagrams for weight-for-age, height-for-age from birth to 16 years old, head circumference-for-age from birth to 3 years and BMI-for-age from 2 to 16 years. Percentile values of growth charts were calculated at the 3rd, 10th, 25th, 50th, 75th, 90th and 97th percentiles as in the standard growth charts [1]. BMI-for-age charts were integrated from age 2 to 16 years because they are recommended to screen children two years or older. The BMI-for-age charts additionally included the 85th percentile line, which was a cutoff point for the diagnosis of overweight children, also there are 5th and 95th percentile lines that indicate malnutrition and obesity cut-offs [29]. For comparative analysis, curves were compiled with mean values weight, height, HC, and values BMI for 50th,75th,85th percentiles for some ages for each gender.

Growth curves are shown in curves 1-8.

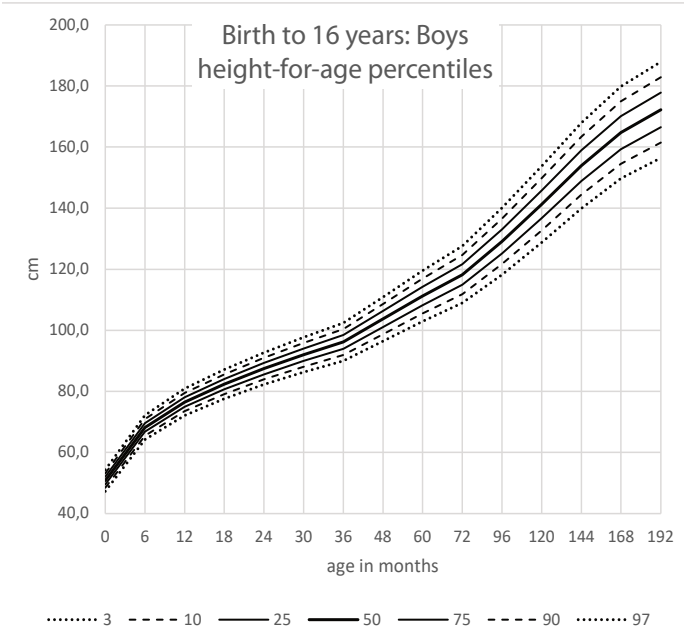

Figure 1. Birth to 16 years: Boys height-for-age percentiles.

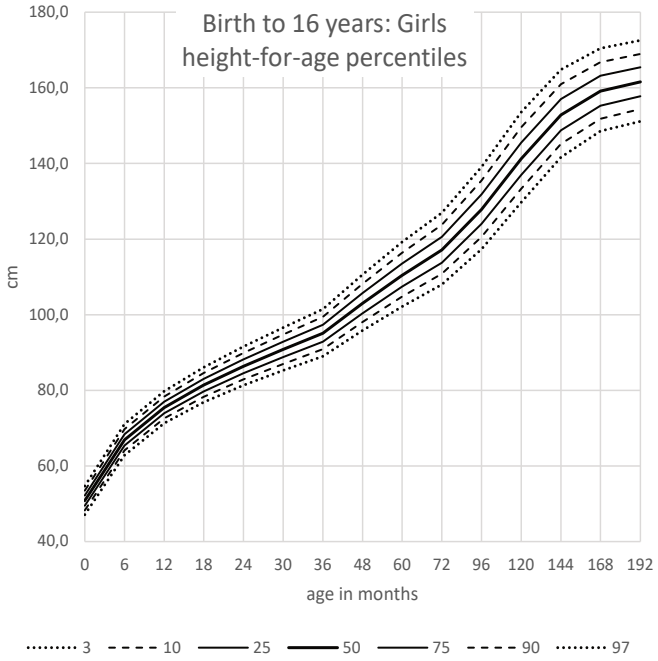

Figure 2. Birth to 16 years: Girls height-for-age percentiles.

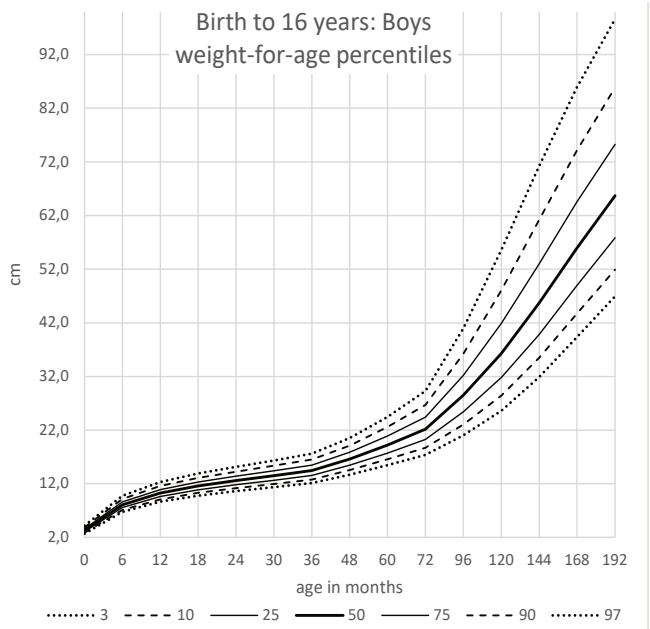

Figure 3. Birth to 16 years: Boys weight-for-age percentiles.

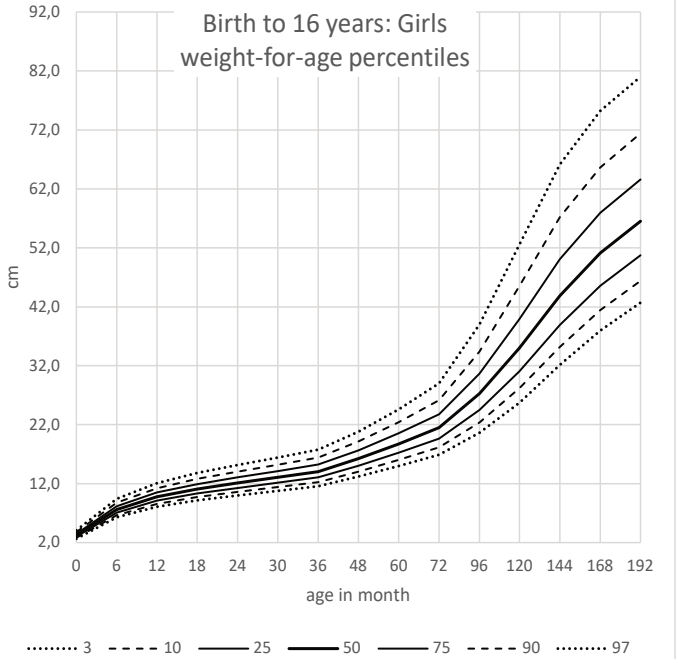

Figure 4. Birth to 16 years: Girls weight-for-age percentiles.

Discussion

Interpretation. The main aim of this study was to collect reference data to be used as a basis for the development of clinically relevant and up-to-date growth charts for local children. In our study, we used the same diagnostic criteria, which was described in the MGRS research [11], that is the study population was a selective one and consisted of children exclusively from well to do families. Since the goal was to display the growth potential of the child population in a favorable environment, to exclude

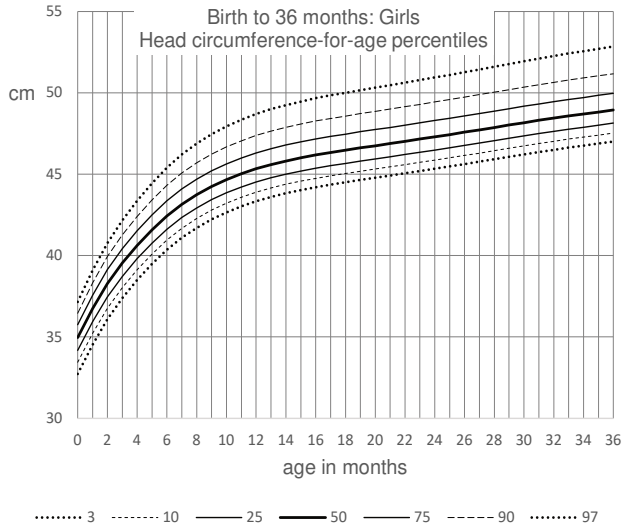

Figure 5. Birth to 36 months: Girls.
Head circumference-for-age percentiles.

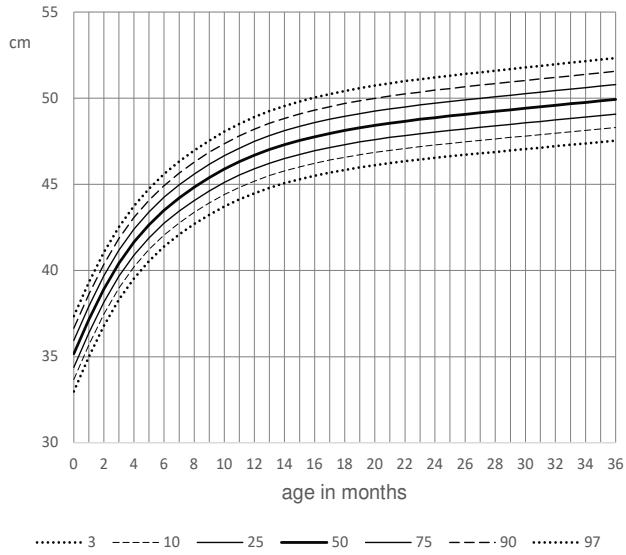

Figure 6. Birth to 36 months: Boys.
Head circumference-for-age percentiles.

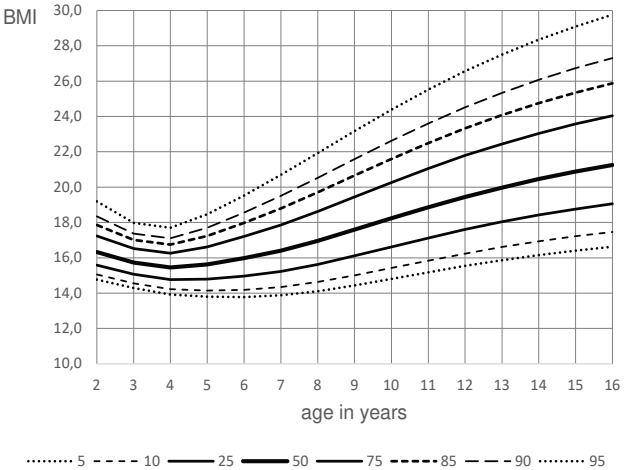

Figure 7. 2 to 16 years: Girls. BMI-for-age percentiles.

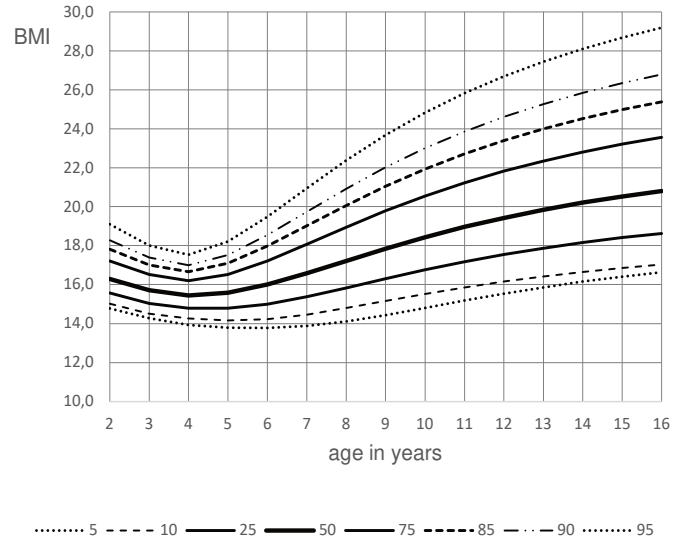

Figure 8. 2 to 16 years: Boys. BMI-for-age percentiles.

adverse effects on the growth of both social-economic and environmental conditions which could have taken place, in the representative sample of the population in Azerbaijan.

Comparison. Length/height and Weight: Values of length/height and weight for local children aged 0 – 4 years we can say not much different from Turkish growth charts and from WHO/CDC growth standards. However, in children older than 5 years of both gender, we observe mean values for height and weight are relatively higher. Although in adolescence, both sexes show a decrease in height compared to both Turkish indicators and WHO/CDC, however, weight indicators remain high. A growth spurt in local girls starts at the age of 9 and slows down significantly already at 15 years old, in boys the jump begins at the age of 10 and after 15 there is a slight slowdown. this can be explained by the predisposition of this population to early puberty. The relatively low growth in adolescents is most likely due to the ethnic and geographic characteristics of the respondents. Head circumference: Mean percentile values head circumference from local boys are not positioned above the WHO/CDC standards for children until 2 years and stay less than Turkish, although by the age of 3 years they become higher than WHO/CDC values, and are closer to Turkish indicators. Mean percentile values of head circumference from local girls are less than Turkish values, close to indicators CDC, but higher than WHO. Body mass index: Of particular concern was the high BMIs in both boys and girls, starting at the age of 6 years. High indicators of weight and BMI are noted both in average indicators and in high percentile indicators. In girls, BMI is higher on average by 1.0, in boys by 2.0 units. Boys in the 75th percentile in our study had a BMI of 23.6 and girls had a mean BMI of 24 at 16 years, these indicators are high and only are just under the adult cut-off for overweight. The 85th percentile in this study shows the index has higher levels than 25 in both gender: of boys-25.4, of girls-25.9. Weight measurements and BMI results indicate that Azerbaijan children, like children in other countries, are prone to become overweight from an early age and that obesity reaches significant proportions starting in pre-pubertal years. The rising trend of BMI rings alarm bells in terms of associated adverse health consequences in adulthood. Similar to other countries, the Azerbaijan population is threatened by an epidemic of obesity starting at young ages. Child or pediatric obesity is now an important public health problem worldwide, especially in developed countries [30]. Comparison curves show in figures 9-16.

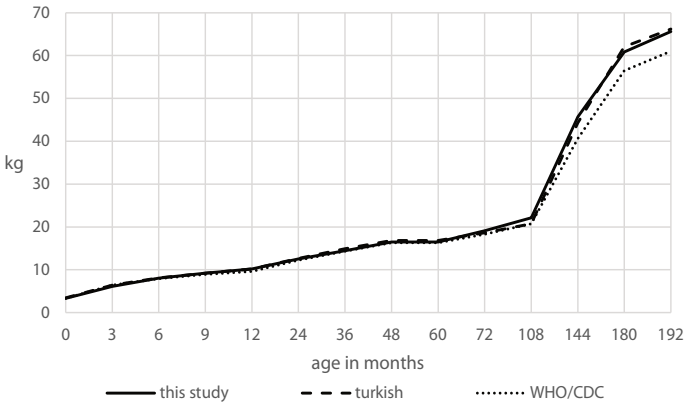

Figure 9. Comparison weight of boys (mean values) from this study, Turkish and WHO/CDC data

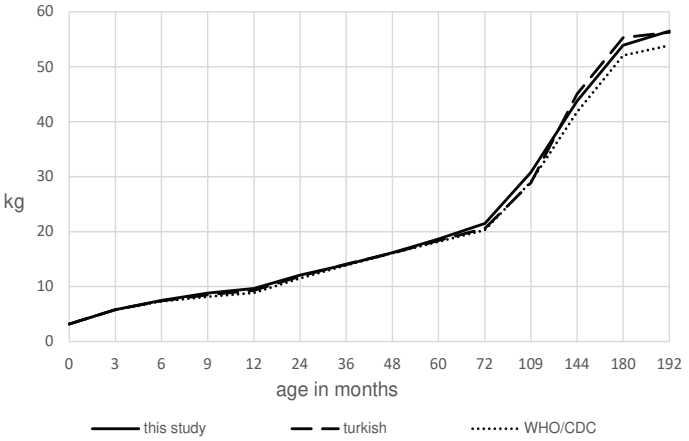

Figure 10. Comparison weight of girls (mean values) from this study, Turkish and WHO/CDC data

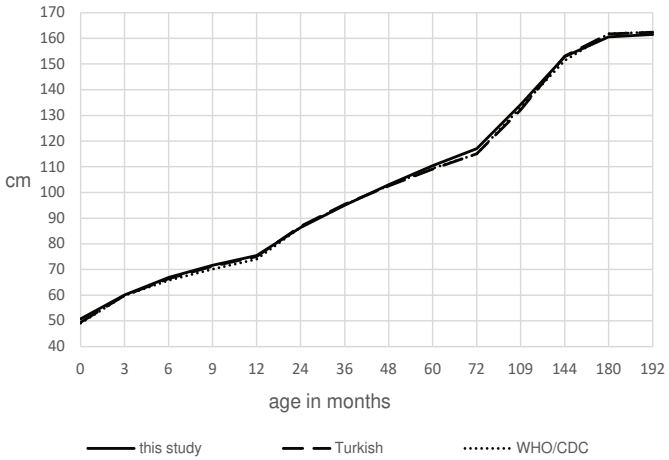

Figure 11. Comparison height of girls (mean values) from this study, Turkish and WHO/CDC data

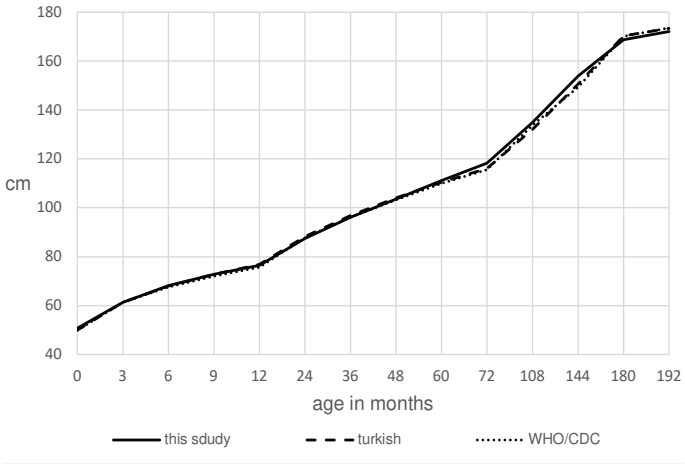

Figure 12. Comparison height of boys (mean values) from this study, Turkish and WHO/CDC data

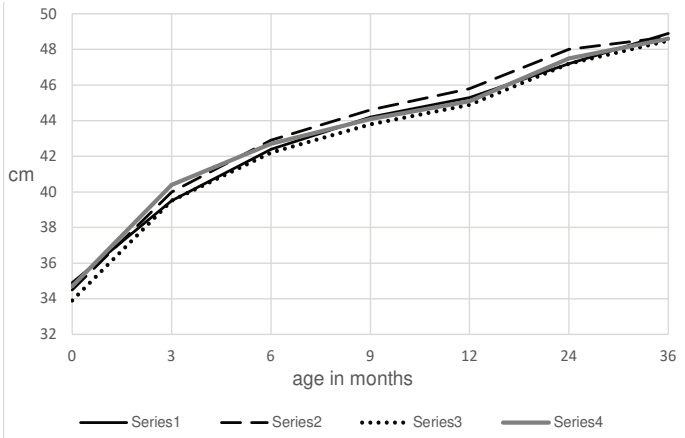

Figure 13. Comparison head curcumference of girls (mean values) this study, Turkish, WHO and CDC data

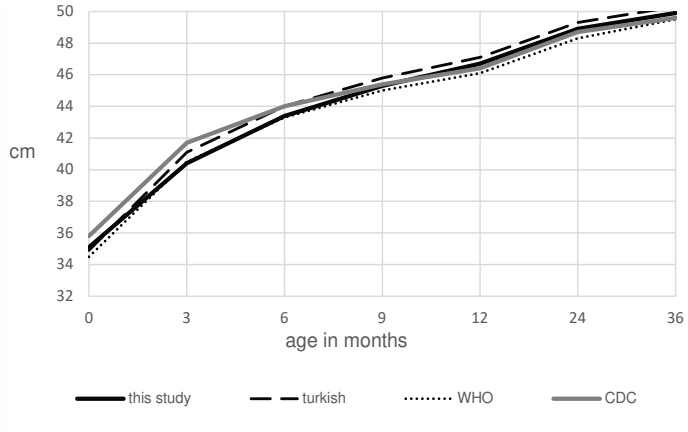

Figure 14. Comparison weight of boys (mean values) from this study, Turkish and WHO/CDC data

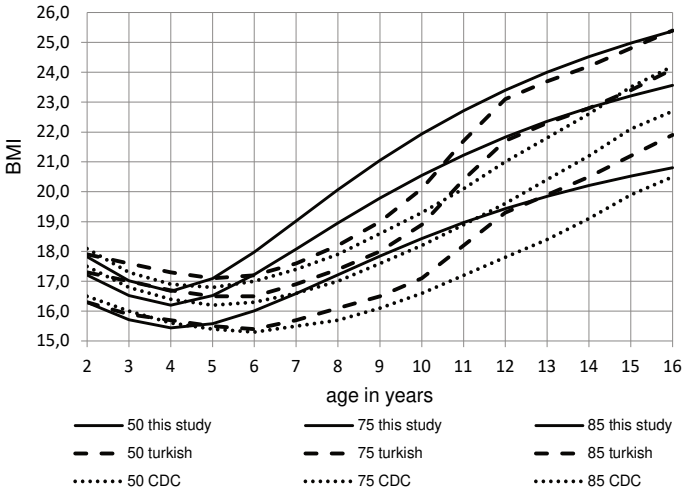

Figure 15. Comparison BMI of boys (50th, 75th, 85th persentiles) from this study, Turkish and CDC data.

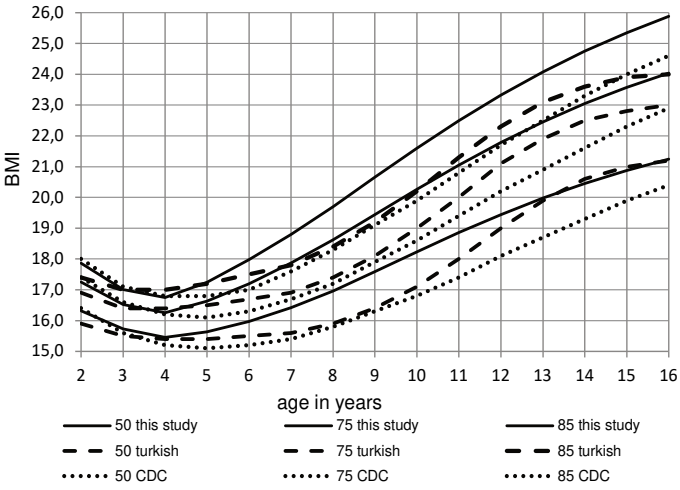

Figure 16. Comparison BMI of girls (50th, 75th, 85th persentiles) from this study, Turkish and CDC data.

Conclusion

We present Azerbaijan national growth charts for children and adolescents, and recommend them for screening and monitoring growth. Growth is one of the best markers of health status both individually and for the population. However, recommended that growth references should be updated regularly [1], because the pattern of growth of children can change with time. Updated references give more exactly informed health to children in the research population currently. This study showed, that local children and adolescents predisposed to overweight. It is an alarm sign that requires the intervention of both medical representatives and nutritionists to promote a more active lifestyle and healthy diet.

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WMA International Code of Medical Ethics

Adopted by the 3rd General Assembly of the World Medical Association, London, England, October 1949 and amended by the 22nd World Medical Assembly, Sydney, Australia, August 1968 and the 35th World Medical Assembly, Venice, Italy, October 1983 and the 57th WMA General Assembly, Pilanesberg, South Africa, October 2006.

DUTIES OF PHYSICIANS IN GENERAL

A PHYSICIAN SHALL always exercise his/her independent professional judgment and maintain the highest standards of professional conduct.

A PHYSICIAN SHALL respect a competent patient's right to accept or refuse treatment.

A PHYSICIAN SHALL not allow his/her judgment to be influenced by personal profit or unfair discrimination.

A PHYSICIAN SHALL be dedicated to providing competent medical service in full professional and moral independence, with compassion and respect for human dignity.

A PHYSICIAN SHALL deal honestly with patients and colleagues, and report to the appropriate authorities those physicians who practice unethically or incompetently or who engage in fraud or deception.

A PHYSICIAN SHALL not receive any financial benefits or other incentives solely for referring patients or prescribing specific products.

A PHYSICIAN SHALL respect the rights and preferences of patients, colleagues, and other health professionals.

A PHYSICIAN SHALL recognize his/her important role in educating the public but should use due caution in divulging discoveries or new techniques or treatment through non-professional channels.

A PHYSICIAN SHALL certify only that which he/she has personally verified.

A PHYSICIAN SHALL strive to use health care resources in the best way to benefit patients and their community.

A PHYSICIAN SHALL seek appropriate care and attention if he/she suffers from mental or physical illness.

A PHYSICIAN SHALL respect the local and national codes of ethics.

DUTIES OF PHYSICIANS TO PATIENTS

A PHYSICIAN SHALL always bear in mind the obligation to respect human life.

A PHYSICIAN SHALL act in the patient's best interest when providing medical care.

A PHYSICIAN SHALL owe his/her patients complete loyalty and all the scientific resources available to him/her. Whenever an examination or treatment is beyond the physician's capacity, he/she should consult with or refer to another physician who has the necessary ability.

A PHYSICIAN SHALL respect a patient's right to confidentiality. It is ethical to disclose confidential information when the patient consents to it or when there is a real and imminent threat of harm to the patient or to others and this threat can be only removed by a breach of confidentiality.

A PHYSICIAN SHALL give emergency care as a humanitarian duty unless he/she is assured that others are willing and able to give such care.

A PHYSICIAN SHALL in situations when he/she is acting for a third party, ensure that the patient has full knowledge of that situation.

A PHYSICIAN SHALL not enter into a sexual relationship with his/her current patient or into any other abusive or exploitative relationship.

DUTIES OF PHYSICIANS TO COLLEAGUES

A PHYSICIAN SHALL behave towards colleagues as he/she would have them behave towards him/her.

A PHYSICIAN SHALL NOT undermine the patient-physician relationship of colleagues in order to attract patients.

A PHYSICIAN SHALL when medically necessary, communicate with colleagues who are involved in the care of the same patient. This communication should respect patient confidentiality and be confined to necessary information.

We work together for the sake of healthy future of Azerbaijan!

Azerbaijan Medical Association

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Azerbaijan Medical Association

ABOUT

The Azerbaijan Medical Association (AzMA) is the country's leading voluntary, independent, non-governmental, professional membership medical organization for physicians, residents and medical students who represent all medical specialties in Azerbaijan.

Association was founded by Dr. Nariman Safarli and his colleagues in 1999. At the founding meeting, the physicians adopted the Statutes and Code of Ethics of the Association. The AzMA was officially registered by Ministry of Justice of Azerbaijan Republic in December 22, 1999.

Since its inception, the AzMA continues serving for a singular purpose: to advance healthcare in Azerbaijan.

- Founded in 1999, the AzMA provides a way for members of the medical profession to unite and act on matters affecting public health and the practice of medicine.
- We are the voice of physicians who support the need for organized medicine and want to be active within their profession.
- We are the representative for Azerbaijan doctors on the world–wide level and the voice of Azeri physicians throughout the world.

MISSION

The mission of the Azerbaijan Medical Association -is to unite all members of the medical profession, to serve as the premier advocate for its members and their patients, to promote the science of medicine and to advance healthcare in Azerbaijan.

GOALS

- Protect the integrity, independence, professional interests and rights of the members;
- Promote high standards in medical education and ethics;
- Promote laws and regulation that protect and enhance the physician-patient relationship;
- Improve access and delivery of quality medical care;
- Promote and advance ethical behavior by the medical profession;
- Support members in their scientific and public activities;
- Promote and coordinate the activity of member-specialty societies and sections;
- Represent members' professional interests at national and international level;
- Create relationship with other international medical associations;
- Increase health awareness of the population.

The association's vision for the future, and all its goals and objectives are intended to support the principles and ideals of the AzMA's mission.

INTERNATIONAL RELATIONSHIPS

Since its establishment, AzMA built close relationships with many international medical organizations and national medical associations of more than 80 countries. The following are the AzMA's international affiliations:

- Full membership in the World Medical Associations (WMA) (since 2002)
- Full membership in the European Forum of Medical Associations (EFMA) (since 2000)
- Full membership in the Federation of Islamic Medical Associations (FIMA) (since 2002)
- Associate membership in the European Union of Medical Specialists (UEMS) (since 2002)

Especially the year 2002 remained with memorable and historical events for AzMA such as membership to the World Medical Association (WMA). Today we are extremely pleased to represent our Association and to be a part of the WMA family.

MEMBERSHIP

A person with medical background, who accepts and follows the AzMA Statutes and AzMA Code of Ethics, may become a member of the Association. The Code of Ethics of the Association shall be the members' guide to professional conduct.

Membership in the AzMA is open to:

- Physicians residing and practicing in Azerbaijan and in abroad.
- Medical students enrolled at medical universities or schools
- Retired physicians

Members can access a special members only area of the AzMA website designed to provide the most up-to-date, and timely information about organized medicine in our country.

To the non-member, we hope you'll discover, through our website how valuable Azerbaijan Medical Association is to medicine in Azerbaijan and will join us.

MEDICINE'S VOICE IN AZERBAIJAN

As the largest physician membership organization in Azerbaijan the AzMA devotes itself to representing the interests of physicians, protecting the quality of patient care and as an indispensable association of busy professionals, speaks out with a clear and unified voice to inform the general public and be heard in the highest councils of government.

The AzMA strives to serve as the Medicine's Voice in Azerbaijan.

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For more information, please visit our website: *www.azmed.az*