

Clinical manifestations of covid-19 in children


- **Ahmad shamsizadeh hayatdavoodi**
Pedatric Infectious Disease Specialist
- **Mohsen alisamir**
Pediatric Pulmonologist
- **Mohammad Reza Mirkarimi**
Pediatric Pulmonologist
- **Mohammad Reza Fathi**
Pediatric Rheumatologist
- with special thanks from Dr **Cheraghian** for statistical analysis when he was suffering of COVID-19
- **Aboozar Children's Medical Center**
Ahvaz Jundishapur University of Medical Sciences

Introduction

- **At the end of 2019, a novel coronavirus was identified as the cause of a cluster of pneumonia in Wuhan, a city in the Hubei province of China**
- **It rapidly spread from China to other parts of the world**

In February 2020, the WHO designated the disease, COVID-19

- **On March 11, 2020, the WHO declared covid-19 a pandemic**

- **Children appear to be affected less commonly than adults**
- **1 to 8 percent of laboratory-confirmed cases**
- **Most cases in children result from household exposures**
- **As the age is increased, the rate of affected children is increased too, except 1 month – 1 year**
- **underlying disease and age < 5 year  rate of hospitalization**
- **In a survey on 5,188 children age 0-9 years, and 12,689 children age 10-19 years through May 2020:**

**Among children 0 – 9 years: fever , cough or shortness
of breath: 63 %**

- **Fever** 46%
- **Cough** 37%
- **Headache** 15 %
- **Diarrhea** 14%
- **Sore Throat** 13%
- **Rhinorrhea** 13%
- **Myalgia** 10%
- **Nausea, vomiting** 10%
- **Shortness of breath** 7%
- **Abdominal pain** 7%
- **Loss of smell or taste** 1%

Clinical manifestations...

- Among children 10 – 19 years : fever , cough or shortness of breath : 60%
- **Headache** 42%
- **Cough** 41%
- **Fever** 35%
- **Myalgia** 30%
- **Sore Throat** 29%
- **Shortness of breath** 16%
- **Diarrhea** 14%
- **Loss of smell or taste** 10%
- **Nausea, vomiting** 10%
- **Rhinorrhea** 10%
- **Abdominal pain** 8%

- **In April of 2020, reports from UK documented a presentation in children similar to incomplete Kawasaki disease or toxic shock syndrome**
- **The condition has been termed Multisystem Inflammatory Syndrome in children (MIS-C)**
- **Incidence : 2 per 100,000**

MIS-C , WHO

- **Children and adolescents 0-19 years of age with fever ≥ 3 days AND two of the following :**
 - 1. Rash or bilateral nonpurulent conjunctivitis or muco – cutaneous inflammation signs (oral, hands or feet)**
 - 2. Hypotension or shock**
 - 3. Features of myocardial dysfunction, pericarditis, valvulitis, or coronary abnormalities (including ECHO findings or elevated troponin/NT- pro-BNP)**

4. Evidence of coagulopathy(by PT, PTT, elevated D-dimer)

5. Acute gastrointestinal problems (diarrhea , vomiting or abdominal pain)

AND

- Elevated markers of inflammation such as ESR , C-Reactive Protein or procalcitonin**

AND

- No other obvious microbial cause of inflammation, including bacterial sepsis , staphylococcal shock syndrome**

AND

- Evidence of covid-19 (RT- PCR , antigen test or serology positive) or likely contact with patients with covid-19**

Pediatric COVID patients in Ahvaz

- Since Esfand 1398 , **1055** suspicious cases of COVID-19 were referred to Ahvaz Aboozar Children's Medical Center. Of them, **197** cases were documented (positive PCR for SARS-CoV-2) , and **177** probable cases.
- From farvardin 1399 - 15 mordad 1399, totally **164** documented cases of COVID-19 were admitted in our hospital (92 males [**56%**], and 72 female [**44%**])

Age: from 2 days to 6 years.

Median: 48 (12 – 96) months(4 years)

- **Positive history of contact with suspicious case =17 , mostly with familial members.**
- **History of contact with documented case =32**
- **Without any contact = 115.**
- **Drug history:**
 - 5 cases corticosteroids and**
 - 14 cases immunosuppressant drugs**

Underlying Diseases(39)

• Malignancy	13
• Bronchial Asthma	6
• Chronic renal disease	6
• Immune deficiency	4
• Cardiovascular diseases	3
• DM	2
• Metabolic disorders	1
• Cerebral Palsy	1
• Hypothyroidism	1
• CF	1
• FTT	1

SYMPTOMS

Symptoms	number	percent
Fever	108	66
Cough	76	46
Nausea, vomiting	55	33.5
Respiratory difficulty	42	25.5
Coryza	22	13.5
Anorexia	19	11.5
Diarrhea	15	9
Abdominal pain	14	8.5
Body pain	6	3.5
Convulsion	5	3
Headache	5	3
Skin rashes	4	2.5
Decreased level of consciousness	3	2

signs

signs	number	percent
Fever	27	16.5
Rales + crackles	18	11
Retraction	11	7
Wheezing	11	7
Cyanosis	4	2.5
Grunting	3	2
Petechiae	1	1

Positive CXR = 79

– GGO	42
– CON	7
– PE	4
– Others	23

Positive C-T Scan =76

– GGO	46
– CON	15
– PE	4
– Sub NOD	3
– Others	12

Prognosis

- **Severity**
 - **mild** **34**
 - **Moderate** **69**
 - **Sever** **24**
 - **Critical** **3**

- **Mortality: 7(4.2%)**
 - **1 Immune Deficiency**
 - **1 Chronic Renal Disease**
 - **1 Congenital Heart Disease**

Laboratory fundings

- **WBC : 7950 (5400 – 12400)**
- **PMN : 60% (40% - 78 %)**
- **ALC : 2560 (1331 – 4422)**
- **Hb : 11 (10 – 13)**
- **PLT : 266000 (174000 – 345000)**
- **ESR : 17 (8 – 34) mm**



Laboratory fundings

- **PT : 11 (10 – 16)**
- **PTT : 28 (26 – 32)**
- **D-dimer : 480 (322 – 1141)**
- **ALT : 19 (13 – 40) U**
- **AST : 25 (18 – 37) U**
- **CPK : 85 (56 – 143) U**
- **LDH : 530 (429 – 714)**

- Since Farvardin 1399, **86** patients labeled as MIS-C . From Them, **24** had criteria of MIS-C , **11** had positive PCR for SARS –COV-2, and **10** had positive lung findings in CT or CXR
- Form 44 cases, 26 cases were males , and 18 females
- Age distribution = 16 - 156 months
median = 72 months (6years)[50-100]

Clinical manifestations

manifestatus	number	percent
Fever	34	77
Skin rashes	30	68
conjunctivitis	29	65
GI Symtoms	24	54
Oral changes	19	43
Extremities chsnge	11	25
Neurological findings	9	21
Lymphadenopathy	5	11
Hypotension	4	9

Laboratory findings

- **WBC :** 8950(7125 – 11600)
- **ALC :** 856(721 – 12)
- **PLT :** 137000(115500 – 2550000)
- **ESR :** 46(25 – 65)
- **LDH :** 563(463 – 701)



Laboratory fundings...

- **CPK:** 65 (35 – 93)
- **Ferritin :** 316 (252 – 679)
- **Fibrinigen :** 403 (323 – 470)
- **d-Dimer :** 1996 (1050 – 3326)
- **PT :** 13 (11 – 15)
- **PTT :** 32 (27 – 36)
- **TG :** 218 (148 – 284)

- CT scan showed positive findings in **11** cases
- Echocardiography was positive in **27** cases

- Mild MR **15**
- Moderate MR **15**
- Mild MI **2**
- MVP **2**



- **Mild TR** **14**
- **AR** **1**
- **LMCA ectasia** **5**
- **RCA ectasia** **3**
- **Mild LV dysfunction** **9**
- **Myocarditis** **2**
- **PE** **1**

Treatment

- **IVIg** **32**
- **Corticosteroid** **30**
(7 cases pulse methyl prednisolone)
- **ASA** **25**
- **Dipyridamole** **3**