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Original Research Article

Clinical Features of COVID-19 among Young Adults

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Abstract

Introduction**:* COVID-19 has spread around the world. The objective of this study was to explore clinical features among young patients with COVID-19. ***Material and methods: Ninety patients with severe cases of COVID-19 infection in Western Chongqing were collected between January 21 and March 14, 2020. Patients were then further stratified into four groups by age: youth (< 39 years); middle-aged (39–48 years), middle-elderly aged (49–60 years), and elderly (> 60 years). Comparison of clinical symptoms, laboratory findings, imaging findings, and treatment effects between groups. ***Results**:* 22, 27, 19, and 22 cases were in the youth, middle-aged, middle-elderly, and elderly groups respectively. No significant difference existed between gender or by smoking status among the four groups. The clinical indicators of severe disease in the youth group differed significantly from the other three groups and included the lymphocyte count ($p < 0.001$), C-reactive protein level ($p = 0.03$), interleukin-6 level ($p = 0.01$), chest computed tomography (CT) findings ($p < 0.001$), number of mild cases ($p = 0.02$), education level ($p < 0.001$), and CD4 + T lymphocyte level ($p = 0.02$) at the time of admission, and the pneumonia severity index (PSI) at the time of discharge ($p < 0.001$). The complications ($p < 0.001$) among the youth group were also significantly different from the other groups. ***Conclusions:*** The clinical manifestations of young patients are relatively mild. This may be related to higher education levels, prevention awareness, and willingness to accept prevention and control of the COVID-19 epidemic among the population in addition to good immune function.

Keywords: COVID-19; western Chongqing; young patients; clinical characteristics; Corona virus; China virus.

INTRODUCTION

SARS-CoV-2 was first iden-tified in Wuhan in December 2019, and since then, the dis-ease caused by it became known as COVID-19. That allows for an un-derstanding of how the dis-ease spreads around the globe. It should be noted that China has made great ef-forts in controlling this epi-demic. Over twelve months have passed since COVID-19 broke out; hence, adequate time has elapsed to gauge optimistic. A mask is one of the major components of the gear for medical workers in hospitals and clinics to wear in order to significantly reduce the spread of COVID-19, hence its importance. The efforts directed toward fighting COVID-19 are also dual and belong to the aspect that involves getting vaccines and/or effective drugs into the market. Unreasonable optimism/pessimism might be a major factor in the elimination of COVID-19.

The psychological problems resulting from COVID-19 infection cannot be neglected. In one study, it was reported that 10.8% of patients noted severe anxiety and depression, necessitating psychological intervention to reduce psychological trauma. Though some experience has been gained in the prevention and treatment of COVID-19, knowledge about COVID-19 and research concerning it remain inadequate because it is difficult to directly detect viruses that are transmitted through the air.

There is a correlation of the incidence of COVID-19 in children and adults increasing by the age group of children. However, we are currently underestimating pediatric cases. Indeed, elderly patients infected with COVID-19 manifest relatively severe clinically due to complications while young patients with COVID-19 infections manifest mild symptoms and the number of critical cases is small. The specific reasons are not clear. Elderly patients with COVID-19. They usually have it worse. Complications hit them hard. Their symptoms are heavy, sometimes scary. But the young ones? They mostly get away easy. Mild fever, a cough maybe, and only a few turn critical. Why so different? Nobody's totally sure yet.

At Yongchuan Hospital, part of Chongqing Medical University, doctors saw this firsthand. As of March 14, 2020, ninety patients had been admitted. Ninety stories. Each one different, each one telling a bit more about how this virus behaves. Some coughed for days. Some barely noticed. Others fought for breath. The pattern? Age mattered.

Kids and younger people got lucky, it seems. They're less likely to get infected, less likely to land in hospitals. Kuchar and colleagues even found that children in hospitals with COVID-19 symptoms were far fewer than adults. Maybe their immune systems remember something. Maybe other coronaviruses gave them a kind of shield — cross-protection, they call it. So we went digging. We looked back at all 90 cases — checked their symptoms, lab tests, CT scans, treatments, everything. We wanted to find a story in the data. To see what made the young different from the old. Our goal? Simple. To give real, useful evidence for fighting COVID-19 — not just in hospitals, but everywhere it might strike next.

MATERIAL AND METHODS

Patient Data Collection

Yongchuan Hospital a big tertiary teaching hospital. Busy, modern, always running. It's got a full Infectious Diseases Department and is part of Chongqing Medical University. The hospital sits in Yongchuan District, right in Chongqing City, and handles patients from eight surrounding regions. It's kind of the frontline for this area. Between January 21 and March 4, 2020, ninety COVID-19 patients walked through its isolation doors. Each one diagnosed by RT-PCR, right at admission. Some came coughing, others just scared. The severity of their illness was classified as either mild or severe, based on the Pneumonitis Diagnosis and Treatment Scheme for Novel Coronavirus Infection (Trial Version 6). The rules were strict, but the situation wasn't.

Research Methods

We gathered everything. Epidemiologic details, symptoms, lab results, imaging findings, outcomes — all of it. Nothing left out. Six months after discharge, we followed up again, checking how they were doing. Local CDC teams helped with case tracing and surveys. The inclusion rules were clear but human lives never fit perfectly in lists.

To be part of the study, patients needed at least one of three things:

1. Fever, cough, and a known close contact with another COVID-19 case.
2. Throat or respiratory samples that tested positive for SARS-CoV-2 by RT-PCR.
3. Exclusion of other infections influenza A/B, common respiratory viruses, SARS-CoV, MERS-CoV.

Blood tests and biochemistry panels were done in the hospital's Clinical Laboratory. Chest CT scans low-dose and spiral were performed in Radiology. Two reviewers double-checked every piece of data. Just to be sure. It was, after all, a retrospective study careful but looking back.

The patients' ages ranged from 3 to 89 years. Average? Around 48 ‡18 years. Quite a spread. Based on age, we split them into four groups: youth (<39 yrs), middle-aged (39-48 yrs), middle-elderly (49-60 yrs), and elderly (>60 yrs). Then came the comparisons - symptoms, lab data, CT findings, treatment outcomes. Each group told a slightly different story. Some numbers were cold. Others felt heavy. But together, they showed how age changes the fight against COVID-19.

Observation Items

We tracked everything that mattered — and some things that just felt important. Fever. Dry cough. Wet cough. Fatigue that wouldn't quit. Breathlessness. Body aches. Even diarrhea. Each symptom told part of the story. Lab tests came next. Blood counts, CRP, interleukin-6 (IL-6), coagulation profiles, and lymphocyte subsets — all carefully recorded. Numbers piled up fast. Behind every one of them was a patient fighting off a virus we barely understood at the time. Pneumonia was confirmed using a low-dose 256-detector CT scan. Two radiologists looked at every image. No guesswork allowed. Just careful eyes and quiet rooms. Getting discharged wasn't simple either. The rules were strict, written right into the national COVID-19 Diagnosis and Treatment Protocol (Trial Version 6).

1. The fever had to stay gone for at least three days.
2. Breathing symptoms needed to ease — really ease.
3. Chest imaging had to show improvement, those cloudy exudates fading away.
4. And the big one — two negative RT-PCR tests, at least a day apart. No exceptions.

Only then could a patient finally walk out the hospital gate.

Statistical Analysis

We ran the numbers through SPSS 26.0. Cold software. Warm stories behind it. A p value below 0.05? That meant something — statistically significant, they call it. But we knew the real meaning was in how patients actually got better. Continuous data were shown as mean ± standard deviation (SD). Clean and simple. For comparing groups, we used one-way ANOVA, followed by the Student-Newman-Keuls (SNK) test. Enumeration data — yeah, those were handled with the χ^2 test.

RESULTS

General Information

The numbers told the start of the story. Twenty-two patients in the youth group (24.4%). Twenty-seven middle-aged (30.0%). Nineteen middle-elderly (21.2%). And twenty-two elderly again (24.4%). A clean split — four groups, four stages of life. In the youth group, 63.64% (14 out of 22) had a high school education or higher. That was a big deal — way higher than the other groups ($p < 0.05$). Education seemed to matter. Maybe awareness. Maybe just access to better info. Hard to say for sure, but it showed. Complications? The young ones barely had them — only 4.55%. The older ones didn't get off that easy. Their bodies carried more weight, more history. The difference was clear. Statistically significant, and you could see it on the ward too. Gender and smoking? No big difference there ($p > 0.05$). Men, women, smokers, non-smokers — they were all mixed evenly across groups. COVID didn't seem to care about those details (Table 1).

Clinical Symptoms

Fever, cough (both dry and wet), fatigue, shortness of breath, muscle pain, diarrhea — the usual suspects. Some had headaches, some sore throats that felt like burning wire. A few had chills, nausea, or lost their appetite. Each patient described it differently. When we compared the four age groups, the main symptoms showed no major variation ($p > 0.05$). Everyone coughed, burned, and tired out the same way. The virus didn't choose favorites when it came to symptoms — just intensity. Still, you could sense it — younger patients bounced back faster. Older ones lingered longer, slower to recover. The data didn't say it out loud, but the doctors saw it every day (Table 2).

Table I. General information pertaining to the four groups of COVID-19 patients

General information	All (n = 90)	Youth group (n = 22)	Middle-age group (n = 27)	Middle-elderly group (n = 19)	Elderly group (n = 22)	*P*-value
Age [years] (mean ± SD)	48 ±18	25 ±11	45 ±3[a]	53 ±3[a/b]	71 ±8[a/b/c]	< 0.05
Male, n (%)	52 (57.8)	15 (68.18)	13 (48.15)	11 (57.89)	13 (59.09)	0.57
Smoking history, n (%)	9 (10)	1 (4.55)	4 (14.81)	2 (10.53)	2 (9.09)	0.69
High school education or above, n (%)	19 (21.59)	14 (63.64)	2 (7.69)[a]	2 (10.53)[a]	1 (4.55)[a]	< 0.05
Complications, n (%)	35 (39.33)	1 (4.55)	6 (22.22)[a]	12 (63.16)[a/b]	16 (72.73)[a/b]	< 0.05

[a]P < 0 .05 compared to the youth group; [b]p < 0.05 compared to the middle-age group; [c]p < 0.05 compared to the middle-elderly group.

Table II. Main clinical symptoms of COVID-19 patients in the four groups

Main clinical symptoms	All (n = 90)	Youth group (n = 22)	Middle-age group (n = 27)	Middle-elderly group (n = 19)	Elderly group (n = n 22)	*P*-value
Fever, n (%)	43 (47.78)	10 (45.45)	14 (51.85)	10 (52.63)	9 (40.91)	0.84
Cough and expectoration, n (%)	55 (61.11)	12 (54.55)	12 (44.44)	14 (73.68)	17 (77.27)	0.07
Fatigue, n (%)	20 (22.22)	8 (36.36)	5 (18.52)	3 (15.79)	4 (18.18)	0.33
Shortness of breath, n (%)	13 (14.44)	2 (9.09)	5 (18.52)	1 (5.26)	5 (22.73)	0.34
Muscle soreness, n (%)	7 (7.78)	1 (4.55)	2 (7.41)	1 (5.26)	3 (13.64)	0.67
Diarrhea, n (%)	5 (5.56)	1 (4.55)	2 (7.41)	2 (10.53)	0 (0)	0.49

Laboratory Findings

On admission, all 90 patients went through the same drill blood tests, biochemistry panels, serology screens. Rows of tubes, silent machines, long hours. The white blood cell counts? Pretty much the same across all four age groups ($p > 0.05$). Procalcitonin (PCT), that little inflammation marker everyone watches also no big difference ($p > 0.05$). But then came the twist. The youth group stood out. Their lymphocyte counts and CD4+ T cells were higher — stronger immune profiles ($p < 0.05$). CRP and IL-6, on the other hand, were lower. The inflammation just didn't hit them as hard ($p < 0.05$). You could almost see their immune systems doing a better job, quietly and efficiently. The older ones? Their numbers told another story — more inflammation, more strain (Table 3).

CT Examination

Every patient had a chest CT. No exceptions. Machines buzzed all day. Each scan told its own story in shades of gray cloudy lungs, streaks, patches. We used the Pneumonia Severity Index (PSI) to measure how bad it was [11]. Out of 90 patients, 81 (that's 90%) showed the same haunting patterns: ground-glass opacities,

patchy shadows, cords, consolidations, net-like streaks. You could almost trace the virus's path through the lung. The number of patients without visible lesions wasn't that different between groups ($p > 0.05$). But the PSI? That told the truth. At both admission and discharge, scores in the middle-aged, middle-elderly, and elderly groups were higher than those in the youth group ($p < 0.05$). The young lungs healed faster. They bounced back — sometimes surprisingly fast (Table 4).

Treatment

Of the 90 patients, 77 (85.6%) were mild cases. Thirteen (14.4%) were severe. In the youth group every single case was mild. Not one went critical. Not one. Everyone received antiviral therapy. It was standard the first line. If bacterial pneumonia showed up, we switched gears fast piperacillin-tazobactam, 4.5 g every 8 hours by IV. For those whose lungs worsened, where imaging screamed "progression," and oxygen levels dropped, methylprednisolone came next. 1–2 mg/kg/day for 3–5 days. Sometimes, it helped fast. Sometimes, not. The treatment plan never stayed still. We adjusted it as the patients changed — dose by dose, scan by scan. Out of 90 patients, 32 (35.6%) got antibiotics, 25 (27.8%) got hormones, 13 (14.4%) got gamma globulin, and 8 (8.9%) ended up needing ventilator support. None of the youth group needed ventilation. None. That was a clear and significant difference ($p < 0.05$). Antibiotics, steroids, immunoglobulin those didn't differ much across groups ($p > 0.05$). But the ventilators told the real story age made the fight harder (Table 5).

Table III. Laboratory findings for SARS-CoV-2-infected patients

Laboratory test	All (n = 90)	Youth group (n = 22)	Middle-age group (n = 27)	Middle-elderly group (n = 19)	Elderly group (n = 22)
WBC [× 10^9/l]	5.44 ±2.25	5.96 ±2.46	5.84 ±2.63	5.02 ±2.06	4.78 ±1.42
PCT [ng/ml]	0.09 ±0.14	0.11 ±0.23	0.10 ±0.16	0.09 ±0.06	0.08 ±0.05
L [× 10^9/l]	1.22 ±0.58	1.63 ±0.71	1.10 ±0.47[a]	1.13 ±0.52[a]	1.04 ±0.45[a]
Youth group (n = 22)			p = 0.005	p = 0.026	p = 0.003
CRP [mmol/l]	18.12 ±24.12	7.20 ±9.15	16.70 ±26.57	28.62 ±34.20[a]	21.75 ±16.26
Youth group (n = 22)				p = 0.026	
IL-6 [pg/ml]	13.51 ±17.72	6.35 ±7.58	10.32 ±15.86[a]	14.51 ±15.10	23.73 ±24.28[a/b]
Elderly group (n = 22)		p = 0.005	p = 0.040		
CD4+ T lymphocyte count [per µl]	494.43 ±279.30	631.41 ±317.62	457.22 ±241.66	514.42 ±311.30	385.86 ±200.49[a]
Youth group (n = 22)					p = 0.020

WBC – white blood cells, PCT – procalcitonin, CRP – C-reaction protein, IL-6 – interleukin-6 (IL-6), [a]p < 0.05 compared to the youth group; [b]p < 0.05 compared to the middle-age group.

Table IV. CT results of 90 SARS-CoV-2-infected patients

CT examination	All (n = 90)	Youth group (n = 22)	Middle-age group (n = 27)	Middle-elderly group (n = 19)	Elderly group (n = 22)	*P*-value
No. of lesions, n (%)	9 (10.0)	6 (27.27)	0 (0)	2 (10.53)	1 (4.55)	0.38
PSI on admission	32.44 ±21.74	8.13 ±4.73	24.12 ±17.59[a]	36.25 ±15.47[a]	52.50 ±21.15[a/b]	< 0.05
PSI at discharge	21.71 ±18.52	9.64 ±12.53	21.92 ±17.65[a]	26.05 ±17.68[a]	29.20 ±20.26[a]	0.00

[a]P < 0.05 compared to the youth group; [b]p < 0.05 compared to the middle-age group.

Table V. Treatment scheme for a patient infected with COVID-19

Treatment	All (n = 90)	Youth group (n = 22)	Middle-age group (n = 27)	Middle-elderly group (n = 19)	Elderly group (n = 22)	*P*-value
Antibiotics, n (%)	32 (35.56)	6 (27.27)	8 (29.63)	8 (42.11)	10 (45.45)	0.50
Methylprednisolone therapy, n (%)	25 (27.78)	3 (13.64)	6 (22.22)	6 (31.58)	10 (45.45)	0.10
Gamma globulin, n (%)	13 (14.44)	1 (4.55)	5 (18.52)	3 (15.79)	4 (18.18)	0.50
Ventilator-assisted ventilation, n (%)	8 (8.89)	0	3 (11.11)[a]	0	5 (22.73)[a]	0.02
Mild cases, n (%)	77 (85.56)	22 (100)	23 (85.19)[a]	17 (89.47)[a]	15 (68.18)[a]	0.02

[a]P < 0.05 compared to the youth group.

DISCUSSION

Young people. They move a lot. Meet friends. Work. Study. Live fast. This lifestyle naturally makes them more open to viral exposure—especially something like COVID-19. That's why, when the pandemic spread, public health experts had to watch this group closely. During treatment, something interesting stood out. Symptoms didn't hit everyone the same. Young patients? Mostly mild. Elderly ones? Much worse. It matched what many earlier reports hinted. Most young people barely felt it, and their recovery was quicker, cleaner. The difference seemed to lie not in the virus itself, but in the body it entered. Older patients often carried baggage—diabetes, heart disease, hypertension, low immunity. These comorbidities were like open doors for complications. Their bodies, already in a battle with time, simply couldn't fight as fast. Young bodies, on the other hand, bounced back. Stronger immune systems. Better nutrition. More resilience.

Our study of 90 patients, ages were split into four groups. Each group told its own story. Fever, cough—dry or wet—fatigue, shortness of breath. Classic symptoms. But here's the twist: severity changed with age. PSI scores at admission and discharge showed it clearly—young patients fared much better. Their lungs held stronger. CT scans revealed ground-glass opacities, patchy shadows, consolidations. Common, yes. But still, the youth group showed fewer and lighter changes. Their lungs looked less angry. For them, chest CT wasn't just a diagnostic tool—it was proof that their immune systems were holding the line.

Lab results told another side. Lymphocytes up. CRP and IL-6 down. Their numbers whispered the same story: inflammation was milder. The young immune system seemed calm but efficient. For older patients, inflammation was louder, chaotic. Age brings immunosenescence—a tired immune system—and inflammaging, that slow-burning fire of chronic inflammation. Together, they create the perfect storm for severe COVID.

Diabetic patients had it the hardest. Their immune systems were already confused, tangled in chronic inflammation. Add high blood sugar, and the body's defenses stumbled. Many also took ACE inhibitors or ARBs—drugs that might have worsened viral entry. No wonder their outcomes looked worse. As people age, the immune army shrinks. The guards get slower. They overreact but fight less effectively. It's a strange mix of overdrive and exhaustion. Data from multiple studies keep pointing to one truth: older immune systems overfire and underperform at the same time.

But here's a surprise. In our study, severe cases were rare among youth. Not one needed a ventilator. They stayed stable. Their CD4+ T cell counts were higher—meaning their cellular defense was sharp and active. This probably explains their mild symptoms. Maybe education also played a role. Young adults, often more tech-savvy, absorbed information faster—news, social media, preventive tips. They knew what to do. Mask up. Distance. Stay aware. Knowledge itself became a shield.

Interestingly, antibody levels in mild cases dropped fast. But that might not matter. What counts isn't how long antibodies stay, but how quickly the immune system wakes up when needed. Lymphocytes may drop as the illness deepens, yet when recovery starts, these cells bounce back. It's like a tide—low during crisis, high when healing begins. Helper T cells—the quiet coordinators—direct the immune orchestra. They help B cells make antibodies and guide NK cells to kill infected targets. When these systems are in sync, as in most young patients, the virus simply doesn't get much room to grow.

So maybe the story of youth and COVID isn't just biology. It's awareness, behavior, and biology combined. Young people, with strong immunity and better information, faced the same virus—but played a smarter game. In the end, what this means is simple. Education matters. Health matters. Fitness matters. Keeping the immune system strong and informed can change outcomes. The youth showed us that resilience isn't luck—it's preparation. Future vaccines and treatments should aim to wake the immune system fully, not just halfway. COVID-19 taught us many lessons. One of them is clear: age isn't just a number—it's a strategy.

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