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CASE SERIES

Clinical Findings and Prognosis of COVID-19 Patients with Benign Prostatic Hyperplasia: A Case Series

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ABSTRACT

Coronavirus Disease (COVID-19) is accompanied by high comorbidities and a worse prognosis in those with underlying diseases. Older men are more vulnerable to COVID-19 infection and Benign Prostatic Hyperplasia (BPH) accounts for a large portion of this population, so this study presented the clinical and paraclinical features of 20 COVID-19 patients with BPH and their outcome. The mean age of participants was 76.8 ± 7.9 years. Respiratory symptoms are the most common complaints and Ground glass and opacities infiltration were the most frequent findings in the chest computed tomography. Mostly the level of C-reactive protein and lactate dehydrogenase were high, but hemoglobin and lymphocyte count were low. They underwent standard management and all were discharged and stayed alive in the one-month follow-up. Besides the high prevalence of BPH and high mortality rate of COVID-19 in older men, the present study showed that COVID-19 patients with BPH had a good prognosis.

INTRODUCTION

Ongoing Coronavirus Disease (COVID-19) pandemic caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV-2) became one of the most challenging issues in the health system, worldwide [1,2]. COVID-19 is a multifaceted disease with multiorgan comorbidities. It is presented as cough, fever, dyspnea, headache, myalgia, and urinary symptoms. COVID-19 is infected millions of people and has a high potency of poor prognosis in those with underlying diseases. COVID-19 is diagnosed by Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) test in the world besides it can make significant non-specific changes in the radiological and laboratory results [3-10].

Benign Prostatic Hyperplasia (BPH) occurs in more than half of men aged 60 years and higher worldwide [11]. It is a result of stromal and epithelial proliferation following the aging population and changes of androgens thus lead to restrict the urine flow and increase the risk of urinary infection. Given the fact that older men are more vulnerable to COVID-19 infection and BPH accounts for a large portion of

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this population, considering their prognosis is of paramount importance [11–15].

Limited studies are presenting the clinical features of COVID-19 in patients with BPH and the prognosis is still a matter of debate [16]. This study aimed to present the clinical and paraclinical features of COVID-19 patients with BPH and their outcome with one-month follow-up.

CASE PRESENTATION

This study was conducted at general internal medicine of Allameh Behloul Gonabadi Hospital Education, Research and Medical Center, affiliated to Gonabad University of Medical Sciences, Gonabad, Iran, between April and August 2020. Twenty patients with COVID-19 were enrolled in this study (Of whom all had BPH and received α -blockers or 5α -reductase inhibitors. They were all Caucasian and resided in Gonabad, Iran. No other underlying disease was reported). COVID-19 was diagnosed based on positive results of the RT-PCR test.

The mean age of participants was 76.8 ± 7.9 years. None

of the patients had a history of close contact with a known or suspected case of COVID-19 in the last 4 two weeks. Most patients complained about dyspnea, cough, and distress. In a systematic review, there was no further complaint except for the aforementioned ones in table 1. Ground glass and opacities infiltration were the most frequent findings in the chest CT-scan reports, but there was no evidence of cavitation, calcifications of lymph node or plaque, cyst, pericardial effusion, mediastinal enlargement, reticulation, fibrotic changes, and bronchiectasis.

The patients underwent standard management according to their clinical status and risk factors. Nine patients received hydroxychloroquine as the main treatment (With no reported side effect) and all of the patients were discharged from the hospital, stayed alive in the one-month follow-up, and revealed no developed symptoms in favor of COVID-19 (Table 1).

Table 2 shows the laboratory findings in CBC, coagulation, inflammation, and biochemical terms. In most cases, the level of CRP and LDH were high and the level of Hb and lymphocyte count were low (Table 2).

Table 1: Baseline information, chest CT-scan findings and treatments.

Case	Symptoms	PMH and Habits	Vital signs	Positive findings in chest CT-scan	Treatment
1	Dyspnea, cough, distress	Nothing	SBP(197), DBP(93), O ₂ Sat(90), T(37), HR(110)	Ground glass opacities infiltration, pleural effusion	Hydroxychloroquine, Ceftriaxone, and supportive therapy
2	Dyspnea	Nothing	SBP(174), DBP(98), O ₂ Sat(90), T(36), HR(100)	Lobular involvement, solid nodules, atelectasis	Supportive therapy
3	Dyspnea, fever, significant weight loss, cough,	Smoking, opium addict	SBP(108), DBP(59), O ₂ Sat(97), T(38), HR(80)	Emphysema, chest wall thickness	Hydroxychloroquine, Azithromycin, Meropenem, Ciprofloxacin, and supportive therapy
4	Fever, diarrhea, loss of appetite, weakness, anorexia,	Nothing	SBP(95), DBP(55), O ₂ Sat(96), T(38), HR(85)	Consolidation, lymphadenopathy, pleural effusion, cardiomegaly, Emphysema	Hydroxychloroquine, Meropenem, Vancomycin, and supportive therapy
5	Dyspnea, low extremities edema, dysphagia, distress	Smoking	SBP(81), DBP(57), O ₂ Sat(75), T(36), HR(109)	Solid nodules	Supportive therapy
6	Dyspnea, weakness, nausea, vomiting	Nothing	SBP(123), DBP(78), O ₂ Sat(97), T(37), HR(70)	Ground glass opacities infiltration	Azithromycin, Ceftriaxone, and supportive therapy
7	General edema, distress	Smoking, opium addict	SBP(81), DBP(57), O ₂ Sat(75), T(36), HR(103)	Solid nodules	Supportive therapy
8	Weakness	Nothing	SBP(108), DBP(63), O ₂ Sat(96), T(37), HR(73)	Pleural effusion	Hydroxychloroquine and supportive therapy
9	Dyspnea, cough, distress	Nothing	SBP(156), DBP(86), O ₂ Sat(93), T(37), HR(101)	Ground glass opacities infiltration, solid nodules	Ceftriaxone and supportive therapy
10	Diarrhea, nausea, vomiting	Nothing	SBP(152), DBP(86), O ₂ Sat(97), T(37), HR(85)	No abnormal findings	Hydroxychloroquine, Ceftazidime, and supportive therapy
11	Fever, dyspnea, weakness	Nothing	SBP(149), DBP(74), O ₂ Sat(95), T(39), HR(90)	Ground glass opacities infiltration	Supportive therapy
12	Fever, nausea, vomiting weakness	Nothing	SBP(128), DBP(93), O ₂ Sat(94), T(39), HR(92)	Ground glass opacities infiltration, Consolidation	Hydroxychloroquine, Ceftriaxone, and supportive therapy
13	Nausea, vomiting	Nothing	SBP(135), DBP(75), O ₂ Sat(93), T(36), HR(85)	Ground glass opacities infiltration, solid nodules	Supportive therapy
14	Chills, dyspnea, cough, distress	Nothing	SBP(142), DBP(78), O ₂ Sat(70), T(37), HR(110)	Consolidation	Hydroxychloroquine and supportive therapy
15	Fever, dyspnea	Nothing	SBP(108), DBP(59), O ₂ Sat(97), T(38), HR(80)	Emphysema	Azithromycin, Ciprofloxacin, Meropenem, and supportive therapy
16	Cough	Nothing	SBP(150), DBP(90), O ₂ Sat(95), T(37), HR(80)	Ground glass opacities infiltration, pleural effusion	Hydroxychloroquine, Cefepime, Co-amoxiclav, and supportive therapy

17	Fever, dyspnea, sweating, cough	Smoking, opium addict	SBP(108), DBP(59), O ₂ Sat(97), T(38), HR(75)	Emphysema	Azithromycin, Meropenem, Ciprofloxacin, and supportive therapy
18	Wheezing, cough	Nothing	SBP(145), DBP(87), O ₂ Sat(91), T(37), HR(90)	Ground glass opacities infiltration	Hydroxychloroquine, Ceftazidime, and supportive therapy
19	Dyspnea, stomachache, cough	Nothing	SBP(138), DBP(89), O ₂ Sat(97), T(37), HR(84)	Ground glass opacities infiltration, Consolidation	Supportive therapy
20	Fever, cough, dyspnea, ageusia, weakness, distress	Nothing	SBP(108), DBP(75), O ₂ Sat(93), T(39), HR(105)	Ground glass opacities infiltration	Ceftriaxone and supportive therapy

PMH: Past Medical History; CT-scan: Computed Tomography scan; HTN: Hypertension; DM: Diabetes Mellitus; CAD: Coronary Artery Disease; SBP: Systolic Blood Pressure; DBP: Diastolic Blood Pressure; O₂ Sat: O₂ Saturation; T: Temperature

Table 2: Laboratory findings in case group.

Case	CBC					Coagulation			Inflammation		Biochemical						
	Hb	WBC	Neut	Lymph	Plt*	PT	PTT	D-dimer	CRP	ESR	LDH	ALT	AST	Bil	Alb	CK	Cr
1	13.2	9600	7800	1300	184	13	24	660	0	-	646	61	32	1.4	4.6	505	1.1
2	13.4	7800	5430	710	80	15.3	33.5	8200	2+	21	787	22	49	0.9	-	179	1.5
3	10.3	10800	8800	1200	436	13	30	-	2+	84	-	-	-	-	-	-	0.8
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	11.7	12000	9900	1500	124	26.4	48.6	>8200	3+	2	820	216	282	1.7	3.5	-	4.3
6	12.4	7400	6200	600	188	13	33.9	-	1+	66	-	-	-	-	-	-	4.5
7	11.7	12000	9900	1500	124	26.4	48.6	>8200	3+	2	820	216	282	1.7	3.5	-	4.3
8	-	8200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	12.3	4100	2296	1189	206	15.8	37.4	-	1+	49	279	11	15	-	4	130	1
10	-	-	-	-	-	-	-	880	-	-	267	-	-	-	4.5	45	-
11	14.8	9100	7660	910	223	16.7	36	-	-	6	-	10	20	-	-	-	1.3
12	15	9500	8600	300	128	17.5	41	940	2+	-	292	40	48	1.3	4.5	28	1.2
13	13.1	4400	1900	1800	89	14.7	32	2740	2+	11	363	19	37	5.1	4.8	86	1.1
14	9.6	10000	8000	1400	439	16.2	36	>10000	1+	98	579	49	38	0.6	3.7	223	0.9
15	10.3	10800	6800	750	436	13	30	-	2+	84	-	-	-	-	-	-	0.8
16	13.7	6600	5100	1000	200	34	104	455	-	47	4.9	-	-	13.4	-	109	3
17	10.3	10800	9600	1200	436	13	30	-	2+	84	-	-	-	-	-	-	0.8
18	14	5800	4582	928	151	14.7	30	4690	3+	5	347	-	-	-	4.1	89	1
19	16.6	7700	5005	2310	250	15.1	35	820	-	-	400	-	-	-	-	52	0.9
20	15.7	3400	600	600	110	13	30	755	3+	4	722	30	55	-	4.2	802	1.2

*Plt was divided by 1000. CBC: Complete Blood Count; Hb: Hemoglobin; WBC: White Blood Cell; Neut: Neutrophil; Lymph: Lymphocyte; Plt: Platelet; PT: Prothrombin Time; PTT: Partial Thromboplastin Time; CRP: C-Reactive Protein; ESR: Erythrocyte Sedimentation Rate; LDH: Lactate Dehydrogenase; ALT: Alanine Transaminase; AST: Aspartate Aminotransferase; Bil: Bilirubin; Alb: Albumin; CK: Creatinine Phosphokinase; Cr: Creatinine. Normal range: Hb (14-17.5), WBC (4000-11000), Plt (150000-450000), PT (12-14), PTT (24-40), D-dimer (<0.5), ESR (<20), LDH (<480), AST (<37), ALT (<41), Bil direct (0.1-0.3), Alb (3.5-5.2), CK (24-170), Cr (0.7-1.4).

DISCUSSION

COVID-19 pandemic became an enormous challenge for the health system. It is presented as a mild to severe infection and spreads at an alarming rate worldwide. The severity of symptoms and the patients' prognosis are function of patients' health condition, demographic and socioeconomic features. Therefore, it is important to evaluate the possible factors associated with the prognosis of COVID-19 patients [17-19].

In this regard, studies declared that the mortality rate in COVID-19 patients was significantly associated with the presence of underlying diseases. Among 45000 COVID-19 patients in China, the mortality rate was ten times higher in those with diabetes mellitus, cardiovascular disease, or hypertension [20,21]. Besides that, elders are at increased risk of COVID-19 infection. A study in Italy showed that more than 90% of COVID-19 patients were over 60 years old, and age was directly associated with the mortality rate [21]. In addition, studies declared that males are at higher

risk of COVID-19 infection and worse prognosis than females. In this regard, studies in China, South Korea, and Italy showed that the mortality rate was 59% to 75% in males with COVID-19, which might be related to androgen-mediated mechanisms [20,22-26]. A study declared that the prevalence of COVID-19 was increased progressively in males over 60 years old. Low testosterone level in older men was associated with the decrease in respiratory muscles activities, which made them more susceptible to COVID-19 infection and poor prognosis. BPH is a known non-cancerous condition that is highly prevalent in older men. Patients with BPH usually have all the aforementioned risk factors, besides the high rate of urinary complications and infection [25].

Therefore, patients with BPH are a suitable population for comparing the findings and prognosis. However, limited studies focused on COVID-19 patients with BPH. Topaktas, et al. [11] investigated the COVID-19 prognosis in 18 patients with BPH and showed that only one of them died, two were admitted to the intensive care unit, and the rest had a good prognosis. Consistent with Topaktas, the present study showed that COVID-19 patients with BPH had a good prognosis.

In summary, COVID-19 is a highly contagious disease and affected millions of people. Besides the high prevalence of BPH in older men and the high rate of COVID-19 infection in the age and gender-matched population, the present study showed that COVID-19 patients with BPH had no exacerbation of BPH symptoms and all had a good prognosis. It is highly recommended to perform further studies with a large sample size and compare more laboratory findings like interleukin titration.

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