PULMONARY ASPERGILLOSIS IN COVID-19 ARDS PATIENTS: A CASE SERIES FROM A SINGLE CENTER EXPERIENCE.

Musso G. (1), Puppo M.(1), Vaninetti A.(1), D'Antonio G.(1), Cantù G.(1), Sales G.(2), Collino F.(2), Fanelli V.(1,2), Rosboch G.(2), Urbino R.(2), Zanierato M.(2), Brazzi L.(1,2), Montrucchio G.(1,2)

1. *Department of Surgical Science, University of Turin, Italy;*
2. *Department of Anesthesia, Intensive Care and Emergency, 'Città della Salute e della Scienza' Hospital, Turin, Italy.*

BACKGROUND

The role of co-infections induced by other respiratory pathogens is an open challenge in the context of SARS-CoV-2 infection. Among them, COVID-Associated Pulmonary Aspergillosis (CAPA) has been reported to be particularly frequent [1]. Although different criteria have been proposed to diagnose this condition, in clinical practice it is often difficult to obtain a definitive diagnosis of CAPA. This, together with the absence of suggestive histological and radiological findings [2, 3], explains why most of the clinical decisions, including the initiation of antifungal therapy, are usually based on clinical, laboratory or microbiological data.

MATERIALS AND METHODS

Between September and December 2020, we analyzed a subgroup of patients with possible/probable CAPA, presenting with a galactomannan positivity on serum or broncho-alveolar lavage (BAL) or with positive culture for Aspergillus species on BAL or broncho-aspirate in a cohort of COVID-19 related ARDS patients.

RESULTS

Out of a total of 70 patients, 7 (10%) met the criteria for possible or probable CAPA (Table 1). Compared to the control group, these patients had similar body mass index, previous diabetes mellitus, absolute number of lymphocytes and absolute number of CD4+ lymphocytes (first available data within 72 hours from ICU admission). All patients underwent mechanical ventilation (MV) and received dexamethasone. The median times from symptoms onset, hospital admission and MV to CAPA were 13 (IQR 11 to 19,5), 6 (IQR 3,5 to 9) and 11 (IQR 8 - 14) days, respectively. Three patients had BAL or tracheal aspirate positive for Aspergillus species; five had galactomannan detection on serum (found positive in 3); four had galactomannan detection on BAL (positive in all cases).
The β-D-glucan (BDG) search on serum was negative in 6 out of 7 patients. Imaging was characterized in all cases by multiple bilateral infiltrates and no pathognomonic signs of aspergillosis were observed. Six out of seven patients received antifungal therapy.
All patients in the subgroup died.

Table 1: Demographics and results

ID	Age Gender	Underlying Disease	Systemic Steroid	Images		MV	RRT	Anti COVID-19 Therapy	Antifungal Therapy	Outcome	Culture	Galactomannan Index		β-D-Glucan Serum	Time to diagnosis (days)		
				ARDS	Cavity							Serum	BAL		Symptoms	Hospital admission	MV
1	58/M	HTN, CKD, DM	Yes	Yes	No	Yes	Yes	No	AMB	Death	A. niger (BAL)	ND	9.49	ND	13	8	6
2	56/M		Yes	Yes	No	Yes	No	No	AMB	Death	A. fumigatus (BAL), A. niger (BA)	0.94	ND	Neg	17	13	7
3	51/M	UC, Obesity	Yes	Yes	No	Yes	No	No	VRC	Death	A. flavus (BA) A. flavus (TA)	Neg	ND	Neg	33	28	27
4	66/M	Ex-smoker, Cardiopathic, CKD, neurological disorder, DM	Yes	Yes	No	Yes	Yes	No		Death		0.6	6.28	Neg	22	15	11
5	62/M	HTN, Obesity.	Yes	Yes	No	Yes	Yes	Tocilizumab	CSP	Death		ND	11.13	Neg	11	8	6
6	79/F	HTN, Active and previous cancer, DM	Yes	Yes	No	Yes	Yes	No	FLU, ISA	Death		2.45	ND	Neg	5	5	1
7	64/F	Ex-smoker, Cardiopathy, HTN, Cronic lung disease.	Yes	Yes	No	Yes	No	No	CSP, AMB	Death		Neg	9.67	Neg	11	11	1

HTN, hypertension; CKD, chronic kidney disease; DM, diabetes mellitus; UC, ulcerative colitis; ARDS, acute respiratory distress; MV, mechanical ventilation; RRT, renal replacement therapy; AMB, amphotericin B liposomial; VRC, voriconazole; CSP, caspofungin; FLU, fluconazole; ISA, isavuconazole; BAL, bronchoalveolar lavage; BA, bronchial aspirate; TA, tracheal aspirate; ND, not done; Neg, negative.

CONCLUSIONS

The relatively high number of CAPA cases in our ICU (10%) seems to confirm the need for a high index of suspicion towards this pathology and encourages the use of appropriate microbiological investigations even in the absence of classical risk factors [4]; imaging and other indirect markers such as BDG seem to play a limited role in the diagnosis of CAPA; the small sample size did not allow to clearly estimate the impact of COVID-related therapy (steroids or tocilizumab) on the likelihood of developing aspergillosis [5]. Future studies are needed to better evaluate the efficacy of an early diagnosis and therapy on the outcome of this pathological condition.

REFERENCES

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