



A CASE OF ACTIVE PULMONARY KOCH'S COMPLICATED BY BRAIN TUBERCULOMA IN COVID-19 PATIENT PRESENTED WITH ACUTE ISCHEMIC INFARCT.

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ABSTRACT Tuberculoma is the most common parenchymal lesion in CNS tuberculosis which could be found in any portion of the intracranial space. The lesion may be solitary or multiple and may be seen with or without meningitis. Postcontrast Magnetic Resonance images usually show a pattern of ring-like enhancement. In times of COVID-19 pandemic it is necessary to distinguish between CT findings of COVID-19 and Pulmonary Koch's and also to consider its coexistence with covid-19 in areas known for epidemics like India. SARS-COV-2 might be more likely to cause thrombotic vascular events, including stroke, than other coronavirus and seasonal infectious disease, a 7.6 fold increase in odds of stroke with COVID-19 compared with influenza was recently reported. We report a rare case of Active Pulmonary Koch's complicated by brain tuberculoma in Covid-19 positive patient who presented with stroke as its manifestation.

KEYWORDS :

INTRODUCTION

Tuberculosis remains a major global health problem. In 2015, an estimated 10.4 million new cases of TB occurred worldwide. The World Health Organization's 'End TB Strategy' calls for a 90% reduction in TB-related deaths and 80% reduction in TB incidence rate by 2030, 15 years on from its declaration. Tuberculosis (TB) is a multi-systemic infectious disease caused by different species of mycobacteria, usually *Mycobacterium tuberculosis* in humans. Involvement of the nervous system is commonly manifested by tuberculous meningitis, tuberculoma or brain abscess. In developing countries, the incidence of tuberculoma varies from 5% to 30.5% of all intracranial space occupying lesions. Tuberculomas are granulomatous mass lesions composed of a central zone of caseation surrounded by a collagenous tissue capsule arising in the brain parenchyma or the spinal cord. The differential diagnosis of tuberculoma includes neurocysticercosis (NCC), coccidiomycosis, toxoplasmosis and metastasis.

Pulmonary Koch's in CT can appear as unilateral or bilateral consolidation, cavitations, scattered airspace nodules, tree in bud appearance, and low density hilar/ mediastinal lymph nodes. The diagnostic gold standard for active tuberculosis (TB) is the detection of *Mycobacterium tuberculosis* (MTB) by culture or molecular methods which includes Nucleic acid amplification testing, Line probe assay and Xpert MTB/RIF assay.

COVID-19 caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is presented with variable CT findings most commonly being ground glass opacities, linear opacities, septal thickening, crazy paving pattern, pleural thickening with lesion distribution in bilateral lung fields or lower lobe involvement with posterior predilection. The standard diagnostic method is rRT-PCR from nasopharyngeal swab. Neurological manifestations in COVID-19 include headache, meningitis, insomnia, metabolic or hypoxic encephalopathy, stroke, epilepsy, encephalitis and myelitis.

CASE REPORT

We report a case of a 62 years old hypertensive and diabetic female belonging to lower socio-economic class residing at Ahmedabad, Gujarat presented to SVP Hospital with chief complaint of sudden onset of dyspnea since 2 days and difficulty in moving her left upper limb since 1 day. She had associated complaints of loss of appetite and generalized weakness since 15 days. No complaints of fever, weight loss, severe headache, disorientation, vomiting or cough were noted.

Patient was tested positive for Covid-19 via RT-PCR and thus was admitted under Covid Intensive Care Facility.

On General examination her vitals were : Temperature - 97.6 F; Pulse : 88/min ; Blood Pressure : 128/88 mm of Hg, RR : 26/min ; SpO₂ : 96 % on room air. Patient was oriented without neurological symptoms but prostrated. In Respiratory system, on auscultation a normal bronchovesicular sound was heard.

Blood reports on Day 1 were suggestive of raised leucocyte count and raised ESR level. Inflammatory markers for covid-19 were in normal range. Thus patient was started on supportive medications with an injectable antibiotic. HRCT Contrast thorax was suggestive active infective etiology in form of consolidation and nodular infiltrates in bilateral lung fields. Multiple subcentimeter and few enlarged lymph nodes were noted in pre paratracheal, prevascular and subcarinal regions. Commonly reporting imaging features of COVID-19 were absent. 2D echo was normal with LVEF : 60%. Homocysteine levels and lipid profile were within normal range.

On neurological examination, plantar was mute in the left side and left nasolabial fold flattening was observed and 0/5 power in the left upper limb. Rest findings were unremarkable.

MRI Brain Contrast was done as per Neuro Physician advice which was suggestive of few well defined ring enhancing lesions in the right cerebellar hemisphere, right frontal lobe and left posterior lobe, possibility of granulomatous etiology - ? neurocysticercosis / Tuberculoma. Acute infarct in the left gangliocapsular region involving lentiform nucleus and posterior limb of internal capsule was also noted. Csf fluid analysis was sent which had raised glucose (152) and protein levels (296.3). No intracranial hypertension was noted. Sputum smear for AFB was positive.

Based on the sputum report and HRCT findings, the patient was diagnosed with active pulmonary koch's which was complicated by brain tuberculoma. She was started on injectable steroids and weight based AKT regimen as per guidelines. Antiplatelets and limb physiotherapy was also started for ischemic infarct. Other inflammatory markers for Covid-19 were within normal range throughout the course. Patient did not require external oxygen support. Ct Abdomen was also done to rule out other focus of active tb. No other focus was found.

Repeat nasopharyngeal swab for Covid-19 was sent on Day 17 of admission which was negative thus the patient was transferred to non covid facility to continue the course for steroids started under observation.

Investigations :

	Day 1	Day 3	Day 9	Day 13	Day 17
HB	12.6	9.8	10.4	9.0	9.5
TLC	15400	2950	3270	4550	8330
APC	399	171	164	241	248
NLR	12.6	3.78	5.71	9.6	11.0
SGPT/SGOT	10/34	10/37	14/20	16/18	13/22
CREAT	0.8	0.57	0.73	0.71	0.53
UREA	24.8	12	22	41	34.2
NA+	145	136	133	144	140
K+	3.5	3.3	3.4	4.3	4.0
CRP	0.01	0.01	0.01	2.31	0.83
ESR	44				40
FERRITIN	116	114	110	112	116
LDH	450	453	450	426	350
D-DIMER	0.58	3.00	2.08	1.60	1.48
PROCALCITONIN	<0.01	0.003	0.003	0.05	NEG
ACETONE	30	10	10	20	<10

RTPCR (NT-OP) : POSITIVE

TSH : 1.07 mIU/l

S.CALCIUM: 8.6 mg/dl

VITAMIN B12 : 460 Pg/ml

HOMOCYSTEINE : 12 mmol/litre

HBSAG : NON REACTIVE

HIV I AND II : NON REACTIVE

HCV : NON REACTIVE

DISCUSSION:

Tuberculosis is an infectious disease usually caused by Mycobacterium tuberculosis primarily affecting lungs but can involve other parts of the body. Immunosuppression is a risk factor for attaining infection or reactivation of latent bacilli. In COVID-19 pandemic times where steroids remain the mainstay of treatment for cytokine storms, one should consider pulmonary koch's as a concomitant disease leading to failing condition of patient. As seen in our case, the patient was admitted as she was Covid-19 positive but the blood reports and radiological findings were suggestive of chronic granulomatous condition. The patient responded after starting the AKT regimen. Mri brain was suggestive of space occupying lesion with ring enhancement. Tuberculomas and neurocysticercosis are the most common differential diagnosis for the same. Tuberculomas are conglomerate caseous foci within the substance of the brain that develop from deep-seated tubercles acquired during a recent or remote period of bacillemia. In our case HRCT thorax was also suggestive of consolidation and sputum AFB being positive, tuberculoma was highly probable, thus neurocysticercosis was ruled out.

Old age, hypertension, and diabetes mellitus are risk factors for stroke. Stroke can be the presenting manifestation of covid-19 as observed in our case. The proposed mechanisms for these cerebrovascular events in covid-19 include a hypercoagulable state from systemic inflammation and cytokine storm; postinfectious immune-mediated responses, and direct viral induced endothelitis or endotheliopathy, potentially leading to angiopathic thrombosis, with viral particles having been isolated from the endothelium of various tissue, including brain tissue. As in our case these factors along with old age, diabetes and hypertension increased the propensity of stroke. Cardiac physiology was normal thus ruling out chances of embolus.

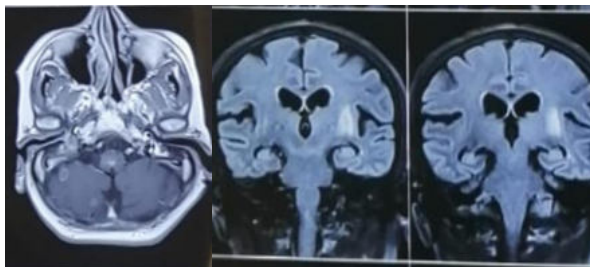


FIG 1:

FIG 2:

Fig 1 : Mri Showing Ring Enhancing Lesions In Right Cerebellum
Fig 2 : Diffusion Mri Showing Infarct Area In Left Gangliocapsular Region

CONCLUSION

We report a case of Pulmonary Koch's complicated by brain

tuberculoma with acute ischemic infarct in covid-19 positive patient. We conclude that it is necessary to rule out tb especially in epidemic areas as both the disease can present with similar HRCT findings. Moreover one should also consider acute stroke as a neurological manifestation of COVID-19 though a rare entity. Thus the association between COVID-19 pneumonia and tb and cerebrovascular events needs to be proven by identifying more cases and reporting them.

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