Cerebral micro bleeds secondary to sepsis ; an un recognized cause of SWI signals.

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INTRODUCTION

According to the definition of **sepsis**, **diagnosis of sepsis** requires the recognition of the systemic inflammatory response syndrome (SIRS) caused by infection as well as recognition of possible infection-related organ dysfunctions for **diagnosis** of severe **sepsis** or **septic shock. Deranged laboratory values and clinical symptoms of patient lead to the diagnosis of sepsis1.**

Susceptibility imaging (SWI) with other basic MRI brain imaging sequences improves the depiction of findings some of which are already evident on the standard sequences, however micro hemorrhages present in wide range of diseases, are depicted on SWI sequence. This case is a rare presentation of micro bleeds in patient presenting with sepsis/DIC

CASE HISTORY

We present a case of 51 years old patient sick since 8 days prior to presentation and was treated with local medicine at home, landed to emergency with lethargy and altered sensorium. His GCS on presentation was 9/15. His respiratory rate was 28/min and blood pressures were 140/90. The patient underwent multiple laboratory tests along with MRI brain with contrast.

On laboratory investigations some of the important findings are stated below

The patient then underwent MRI brain to rule out any organic cause of altered sensorium, which showed numerous widespread signal dropouts on variable sizes scattered in both cerebral hemisphere involving grey white matter junction, deep white matter and basal ganglia, sparing the corpus callosum. Multiple signal dropouts also noted in bilateral cerebellar hemispheres including dentate nucleus and brain stem which were less conspicuous.

LABORATORY ANALYSIS

s.no	Lab	Unit	value	Range
1	WBC	17.9	X10E9/L	4.8-11.3
2	PLATELET	144	X10E9/L	154-433
3	PT	13.5	Seconds	9.3-12.8
4	INR	1.3	RATIO	0.9-1.2
5	LDH	378	IU/L	120-246
6	PROCALCITONIN	3.67	NG/ML	>2.0 NG/L= SEVERE SEPSIS
7	C-RPRO	171.97	MG/L	0-10
8	FERRITIN	1024.2	NG/ML	22-322
9	D-DIMER	4.5	MG/L	<0.5MG/L
10	E-GFR	5.5	ML/MIN/1.73 M2	>60 ML/MIN/1.73 M2

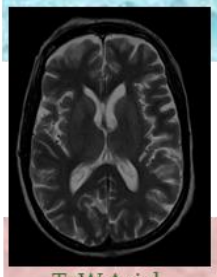
IMAGING FINDINGS

Key Diagnostic features:

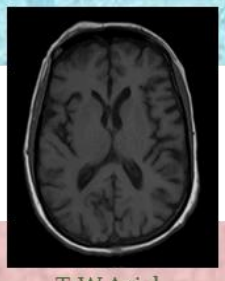
CT head was done which showed few tiny hyperdense foci scattered in the brain parenchyma. There was no surrounding edema or mass effect. Possibility of cavernoma was raised and MRI was advised.

MRI is the best modality to detect microbleeds especially the susceptibility weighted sequence.

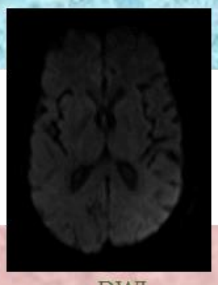
- **On T1, T2 and FLAIR sequences there was no signal abnormality seen in the brain.**
- **On DWI /ADC mapping no restricted diffusion seen with normal ADC values.**
- **On susceptibility images there were numerous variable sized signal dropouts in supra and infra tentorial regions of the brain in subcortical areas predominantly in bilateral cerebral hemispheres and basal ganglia without corresponding to other sequences.**
- **Time of Flight MRA was also done which was normal.**



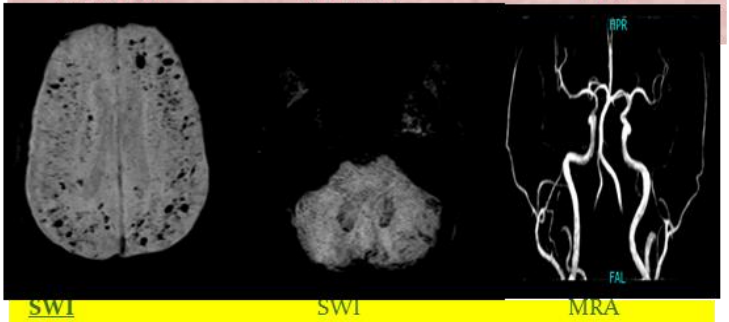
T2W Axial



T1W Axial



DWI



SWI SWI MRA

DISCUSSION

SWI is an important MRI sequence which is a combination of specific sequences to enhance the contrast T2*W images to especially look for the de-oxyhemoglobin in veins and cerebral micro bleeds. Susceptibility weighted imaging has improved spatial resolution enhance susceptibility contrast . SWI is sensitive to compounds that distort the local magnetic field like calcium and iron2.

Cerebral microbleeds are usual presentation of many pathologies such as chronic hypertension, cerebral amyloid angiopathy and diffuse axonal injury 4. In these disorders different parts of the brain are involved, as in hypertension there is predominance of basal ganglia and thalamus and in amyloid angiopathy there is predominance of parieto-occipital regions 4.

These sequences are now incorporated in the daily practice, as it is specifically important in detecting haemorrhage, however it is not always done in multiple regions in patients with sepsis, because of prompt evaluation in those patients. Thus, the presence of intra cerebral micro bleeds is under diagnosed then we currently suppose3.

Klein et al, described the cerebral micro bleeds in infective endocarditis5. Correa et al, described intracerebral micro bleeds in patients with sepsis. As this case report points towards this unusual presentation of micro bleeds, whenever present which needs to be correlated with the history and laboratory findings of patients which needs clinical correlation.

CONCLUSION

In conclusion, the widespread use of detailed MRI in patients presenting with unexplained neurological symptoms along with complete laboratory and clinical workup may lead to the correct diagnosis and prompt treatment. SWI is nowadays incorporated in the main sequences. SWI has known superiority in detecting micro haemorrhages in the brain which may be not an obvious finding on the conventional MRI sequences. This case highlights the importance of SWI sequence as well as one of the ignored cause of micro bleed which we usually encounter in our clinical practice and radiological imaging.

REFRENCES