HISTOPATHOLOGICAL FEATURES OF POST COVID MUCORMYCOSIS PATIENTS WHO UNDERWENT SURGERY

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- NO FINANCIAL DISCLOSURE

INTRODUCTION:

- Mucormycosis is an opportunistic devastating fungal rhino – orbital-cerebral infection.It spreads through spores through nasal route.

- Because it is a rapidly progressive fungal disorder, delay in identification & management leads to high morbidity and mortality.
- It can also cause pulmonary embolism but pulmonary mucormycosis is relatively rare.

- Other clinical presentations are cutaneous, Gastrointestinal, bone &joint infection and disseminated mucormycosis

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Aims:

- To study the histological features in postcovid invasive rhino-orbito-cerebral mucormycosis

Objectives

- to determine the type of inflammation (suppurative/ granulomatous/ sparse /absent)
- Invasion into soft tissues
- Type of spread (angio/perineural)
- Presence of necrosis/infarction/fungal morphology.

MATERIALS AND METHODS

- This is a hospital based cross sectional study
- Patients with post covid mucormycosis are classified with the help of ROCM classification
- Tissue sections from 50 patients with invasive rhino-orbito-cerebral mucormycosis were included in the study.
- Demographic features , predisposing conditions ,and clinical features were obtained from medical records.
- Tissue sections were reviewed with hematoxylin and eosin(H&E), Gomori's methenamine silver(GMS), and periodic acid Schiff (PAS) .

Inclusion criteria

- Histo pathological reports of 50 post covid mucormycosis patients by the help of diagnostic nasal endoscopy and MRI) are included in the study

Exclusion criteria

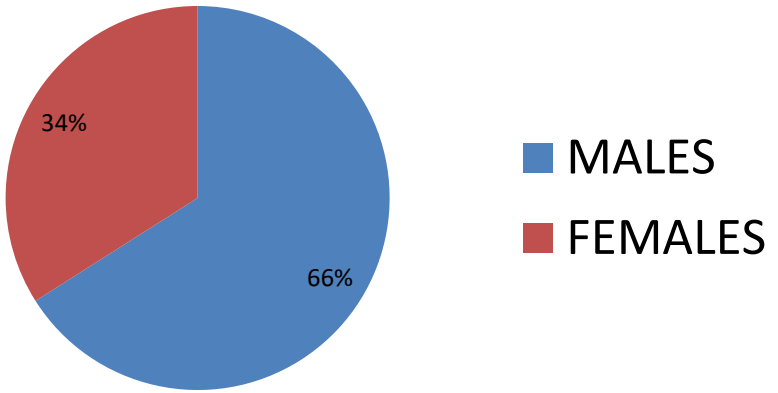
- Patients with other infections are excluded from the study

RESULTS:

Totally 50 patients fulfilling the inclusion criteria were included in the study.

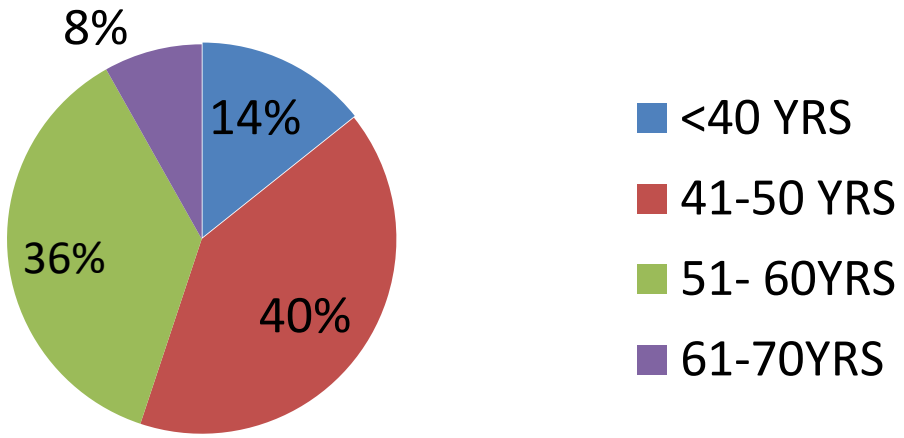
GENDER DISTRIBUTION

	Males	females
Post covid mucormycosis	33	17
%	66%	34 %



AGE DISTRIBUTION OF POSTCOVID MUCORMYCOSIS

Age distribution	Post covid mucormycosis	%
<40 yrs	7	14%
41-50 yrs	20	40%
51-60 yrs	18	36%
61-70 yrs	4	8%
>70 yrs	1	2%
Total	50	

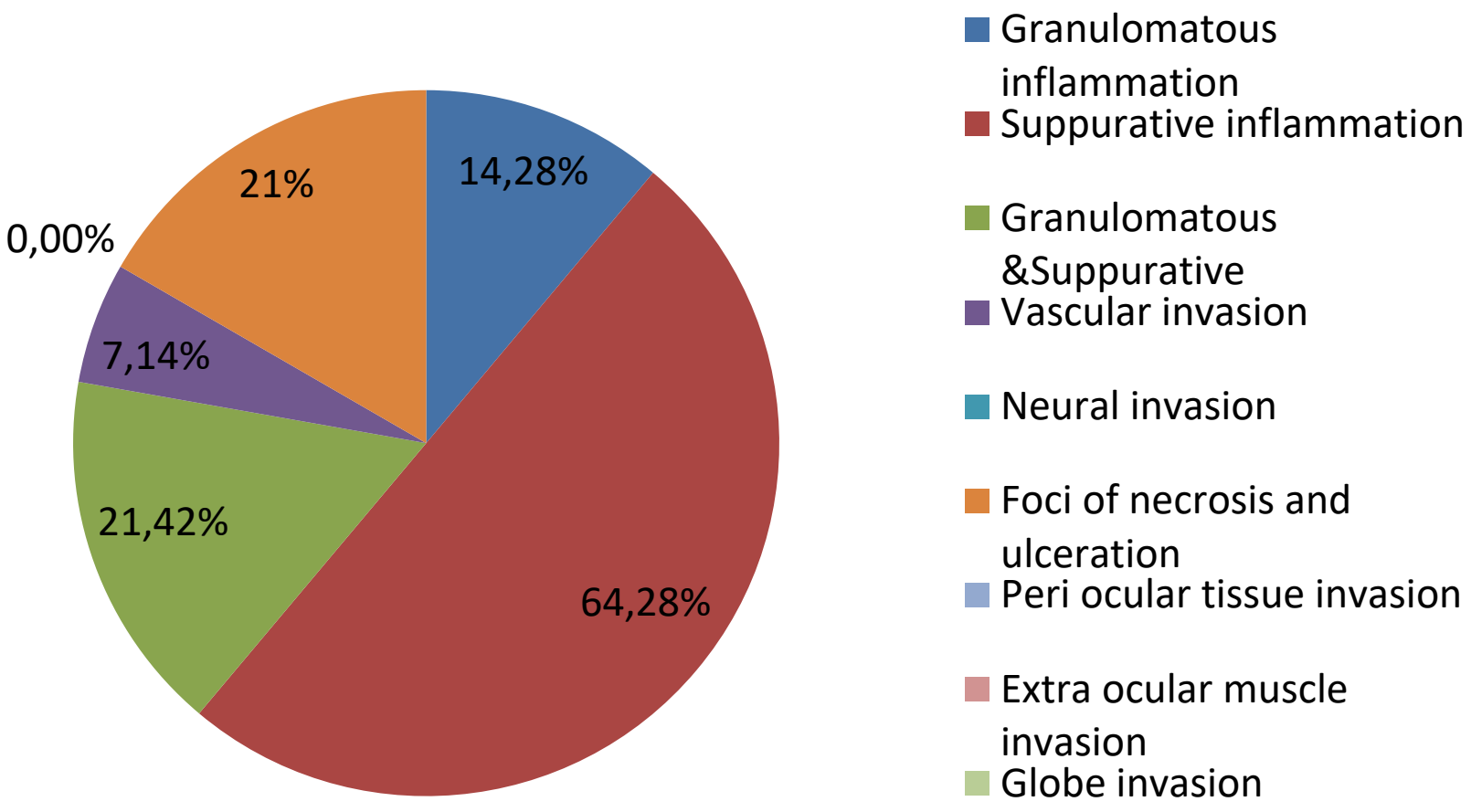


Post covid mucormycosis patients with ROCM grades and management

Stage of ROCM	No. of patients	%	Surgical management
Stage 1	0		
Stage 2a	2	4%	FESS
stage 2b	8	16%	FESS
stage 2c	4	8%	FESS
Stage 3a	13	26%	FESS with OD
Stage 3b	5	10%	FESS with OD
Stage 3c	11	22%	FESS with OE
Stage 3d	1	2%	FESS with OE
Stage 4a	6	12%	FESS with OE with NS intervention

Histopathological features seen in stage 2 pts underwent surgery(FESS)total patients-14

Histological features	No of patients	%
Granulomatous inflammation	2	14.28%
Suppurative	9	64.28%
Granulomatous +suppurative	3	21.42%
Vascular invasion	1	7.14%
Neural invasion		0
Foci of necrosis and ulceration	3	21.42%
Periocular tissue invasion	0	0
Extra ocular muscles invasion	0	0
Globe invasion	0	0

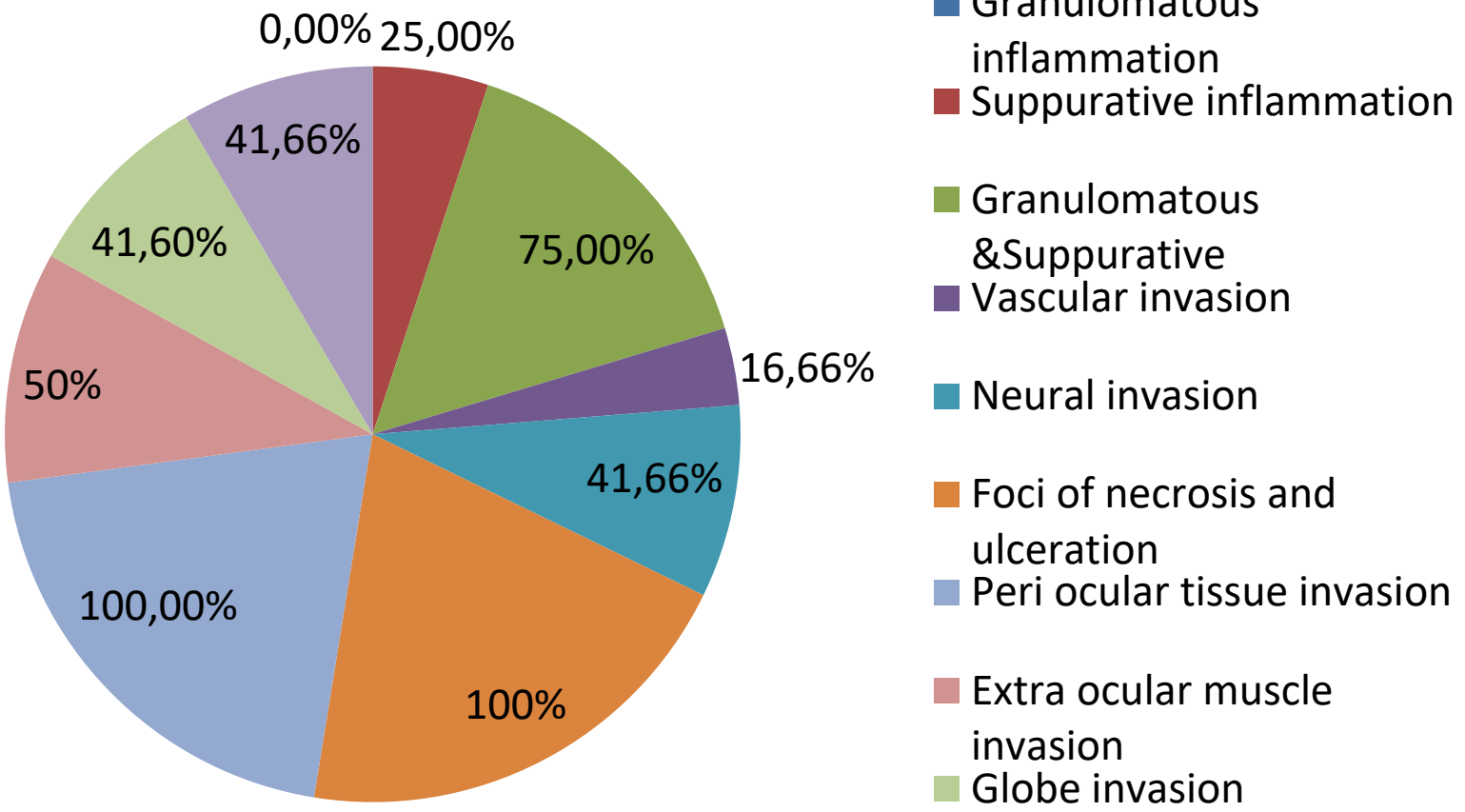

14,28%
64,28%
21,42%
7,14%
0,00%
21%
Granulomatous inflammation
Suppurative inflammation
Granulomatous &Suppurative
Vascular invasion
Neural invasion
Foci of necrosis and ulceration
Peri ocular tissue invasion
Extra ocular muscle invasion
Globe invasion

Histopathological features seen in stage 3a &3b pts underwent surgery(FESS+Orbital decompression)total patients-18

Histological features	No of patients	%
Granulomatous inflammation	4	22.22%
Suppurative	7	38.88%
Granulomatous +suppurative	7	38.88%
Vascular invasion	3	16.66%
Neural invasion	2	11.11%
Foci of necrosis and ulceration	5	27.77%
Periocular tissue invasion	3	16.66%
Extra ocular muscles invasion	2	11.11%
Globe invasion	0	0

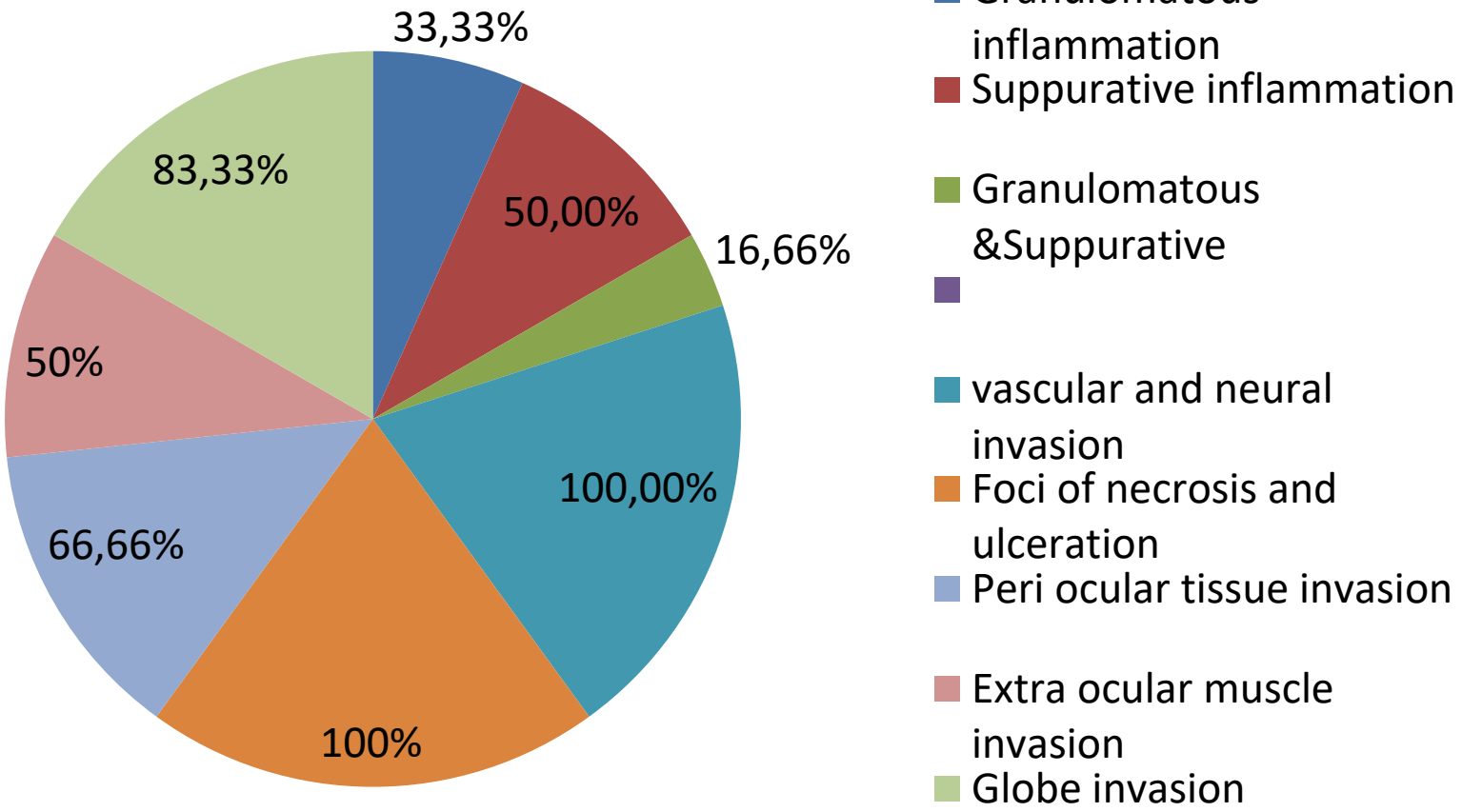
Histopathological features seen in stage 3C &3d pts underwent surgery(FESS with orbital exenteration)total patients-12

Histological features	No of patients	%
Granulomatous inflammation	0	
Suppurative	3	25%
Granulomatous +suppurative	9	75%
Vascular invasion	2	16.66%
Neural invasion	5	41.66%
Neural & vascular invasion	5	41.66%
Foci of necrosis and ulceration	12	100%
Periocular tissue invasion	12	100%
Extra ocular muscles invasion	6	50%
Globe invasion	5	41.6%


0,00%
25,00%
41,66%
75,00%
41,60%
16,66%
50%
41,66%
100,00%
100%
Granulomatous inflammation
Suppurative inflammation
Granulomatous &Suppurative
Vascular invasion
Neural invasion
Foci of necrosis and ulceration
Peri ocular tissue invasion
Extra ocular muscle invasion
Globe invasion

Histopathological features seen in stage 4a pts underwent surgery(FESS, orbital exenteration& neurosurgery intervention)total patients-6

Histological features	No of patients	%
Granulomatous inflammation	2	33.33%
Suppurative	3	50%
Granulomatous +suppurative	1	16.66%
Vascular&neural invasion	6	100%
Foci of necrosis and ulceration	6	100%
Periocular tissue invasion	4	66.66%
Extra ocular muscles invasion	3	50%
Globe invasion	5	83.33%


33,33%
50,00%
16,66%
100,00%
100%
66,66%
50%
83,33%
Granulomatous inflammation
Suppurative inflammation
Granulomatous &Suppurative
vascular and neural invasion
Foci of necrosis and ulceration
Peri ocular tissue invasion
Extra ocular muscle invasion
Globe invasion

- Type of fungal species seen in all histological slides

Type of fungal species	No of pts	%
Broad aseptate irregular branching hyphae	50	100%

DISCUSSION:

- Mucormycosis is an opportunistic devastating fungal rhino-orbito-cerebral infection. Of the total 50 pts(with mean age of 47.66yrs) males are 66%,females are 34%.
- Combined granulomatous and suppurative inflammation(60%).
- Combined Angio & perineural invasion with subsequent infarction of the surrounding tissues was noted in all cases stage 3d and 4a
- Necrosis and areas of infarction , globe invasion and periocular tissue invasion are seen in tissue sections of all stage 3c, 3d, and 4a patients(severe disseminated disease)
- All the tissue sections showed broad aseptate irregularly branched fungal hyphae
- In the study conducted by sundaram et al suppurative inflammation seen in 83.33%(in our study it is 44%) , angio invasion seen in 83.33%(it is 34%), soft tissue invasion seen in 66.66 %, perineural I vasion seen in 50% (36%)(because their sample size is less than our study,in all of their tissue sections candida and rhizopus are seen

- **CONCLUSION**: Advanced cases of post covid Mucormycosis showed combined neural and vascular invasion . Mixed granulomatous and suppurative inflammations is common association seen in histopathological sections

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