

**PATTERN OF OPPORTUNISTIC INFECTIONS  
IN ART NAIVE HIV INFECTED/ AIDS  
PATIENTS - a hospital based study**

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# INTRODUCTION

- Host parasite interaction (Casadeval A Priofski LA 2002).
- OIs
  - Complicate HIV infection and vice versa
  - Toxic and expensive therapy
  - Repeated hospitalization
  - Substantial morbidity and mortality
  - Shortening survival of PLHA.

- ↓CD<sub>4</sub>+T cells count → Multiple OIs
- Changing clin. spect. of disease
- Clin. Spect. of disease reflects → endemic infections prevalent in particular area
- Western countries – smaller no. of pathogens for majority of OI in contrast to India
- In India diagnosis of OI → clinical S/S & when polymicrobial
- ↑ no. of HIV/AIDS in India → lack of information of OIs in diff. parts of India.

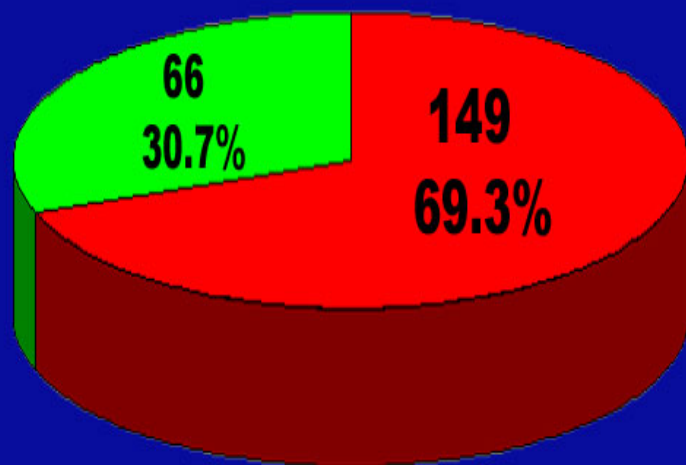
# MATERIALS & METHODS

- Study period – January 2005 – Dec. 2007
- Place of study – RIMS Hospital, Manipur, India
- Ages group – 20-60 years of both sexes
- Exclusion criteria - HBV & HCV co-infection and on ART

- Diagnosis of HIV – NACO (India) guidelines
- Confirmation of OIs – in the dept. of microbiology, pathology, radiodiagnosis depending on clinical presentation and from suitable samples
- CD<sub>4</sub>+T cell count by using Fluorescent Activated cell Sorter (FACS) machine

# RESULTS

- Of 1260 HIV infected patients admitted in Medicine Ward, 302 patients were ART naive, of these 299 (22.33%) patients who gave consent were screened for OIs. 215 (73.12%) patients were found to have OIs



- Male 149 (69.3%)
- Female 66 (30.7%)

**Table 1: Distribution of age, sex and risk factors.**

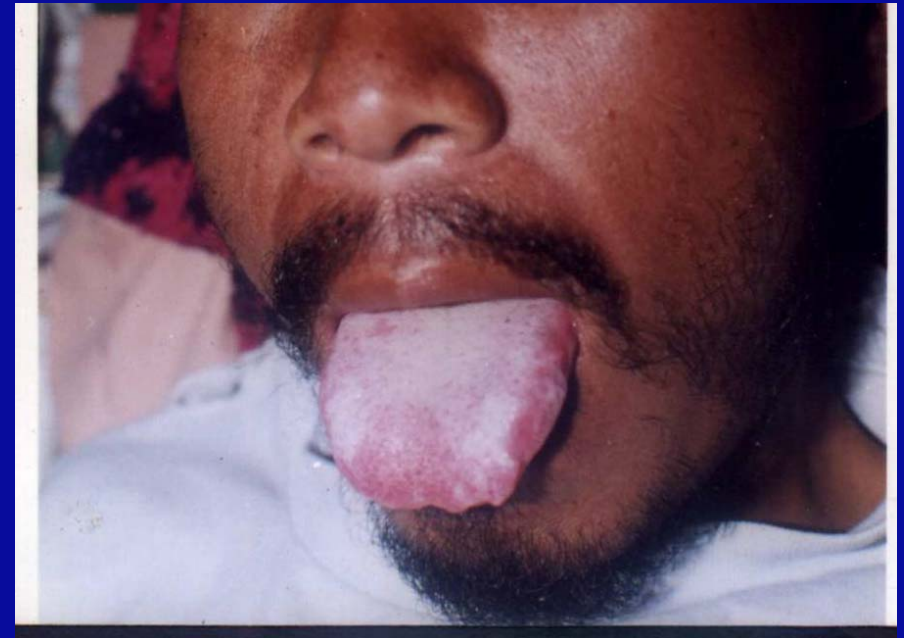
Age (in yrs.)	Total No.		IDUs		Sexual promiscuous		Spouse Infected		Homosexual	
	M	F	M	F	M	F	M	F	M	F
20-30	40	22	25	2	8	2	4	16	3	0
<b>31-40</b>	66	24	30	0	29	4	6	20	1	0
41-50	35	18	18	0	13	3	4	15	0	0
51-60	8	2	5	0	3	0	0	2	0	0
Total	149	66	78	2	53	14	14	50	4	0
	215		<b>80 (37%)</b>		67 (31%)		64 (30%)		4 (1.9%)	

## Table 2: OIs in relation to CD<sub>4</sub>+T cell count.

OIs	CD <sub>4</sub> +T Cell count (mm <sup>3</sup> )					
	0-50	51-100	101-150	151-200	>201	Total (%)
Candidiasis	7	6	6	6	4	29 (13.46)
Tuberculosis	8	6	5	3	3	25 (11.63)
Cryptococcosis	9	6	5	1	0	21 (9.77)
Penicilliosis	10	8	2	0	0	20 (9.30)
Cryptosporidiosis	3	7	5	3	0	18 (8.37)
Toxoplasmosis	6	8	1	0	0	15 (6.98)
Bacterial Pneumonia	1	1	2	5	5	14 (6.51)
PCP	5	6	1	0	0	12 (5.58)
Isospora belli	2	4	3	1	1	11 (5.11)
Salmonellosis	0	1	1	3	3	8 (3.72)
HZV	1	1	1	3	2	8 (3.72)
HSV	1	1	1	2	2	7 (3.25)
Shigellosis	0	0	1	2	3	6 (2.79)
Cyclosporiasis	1	2	2	1	0	6 (2.79)
PML	5	0	0	0	0	5 (2.32)
CMV	3	0	0	0	0	3 (1.36)
Aspergilloma	3	0	0	0	0	3 (1.36)
M. Contagiosum	2	0	0	0	0	2 (0.93)
Condylomalata	1	0	0	0	0	1 (0.46)
E Coli	0	0	0	0	1	1 (0.46)
<b>Total</b>	<b>68</b>	<b>57</b>	<b>36</b>	<b>30</b>	<b>24</b>	<b>215 (100)</b>



# Oral candidiasis



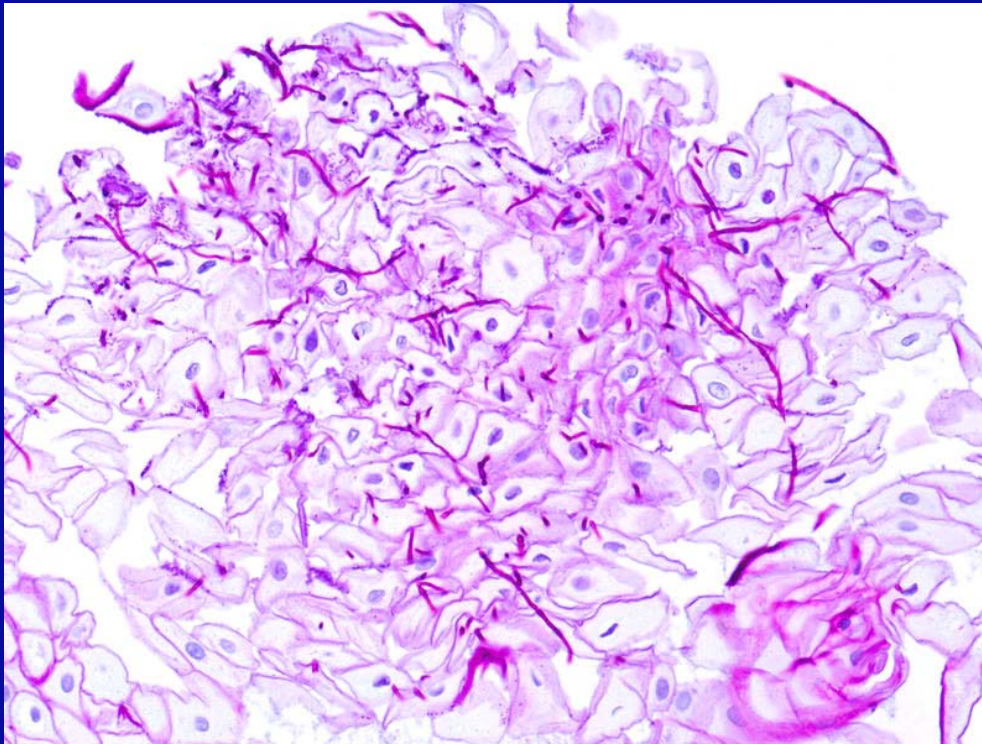


Oesophageal Candidiasis

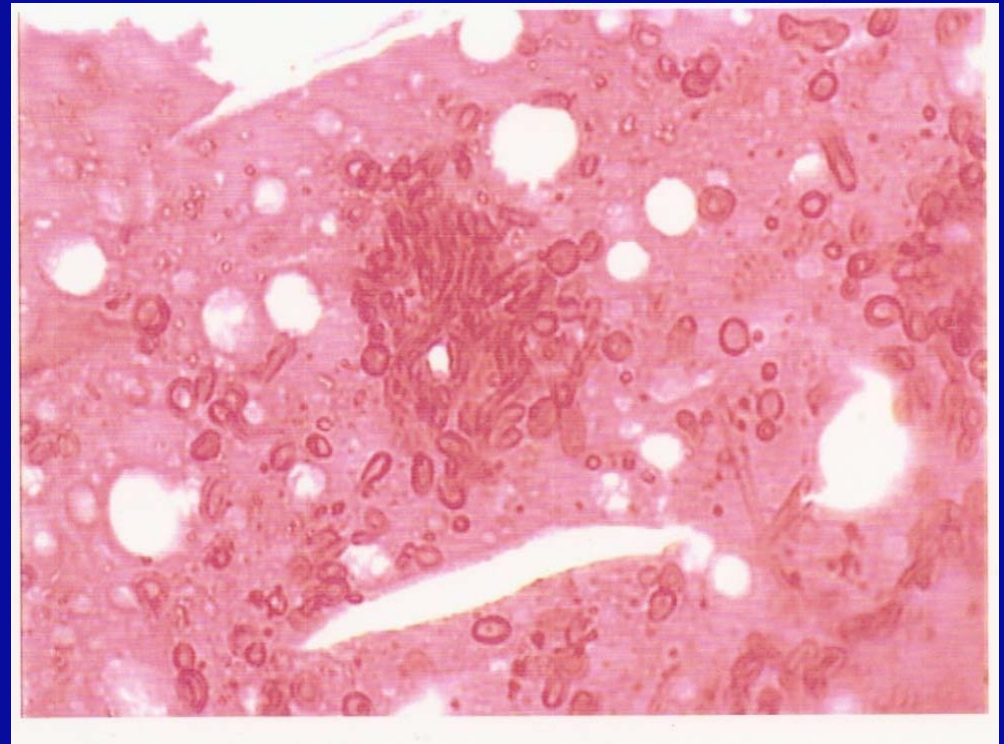


# Pseudohyphae & yeast forms of candida spp.

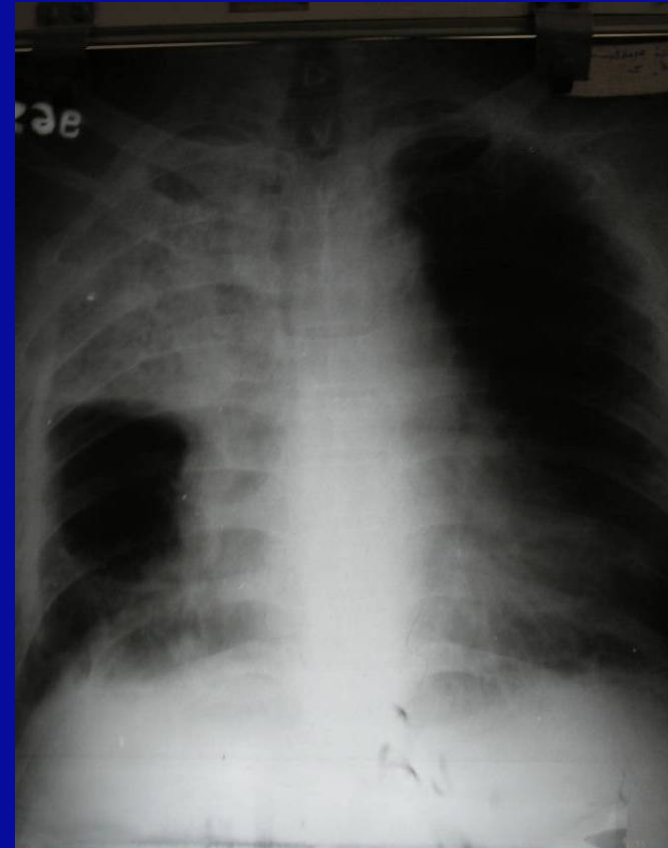
(H & E stain)



(Gram stain)



# Tubercular middle & upper zone lesions



## Hilar adenopathy & pleural effusion



**L. Middle and R. lower zone lesions**



**Right middle zone**

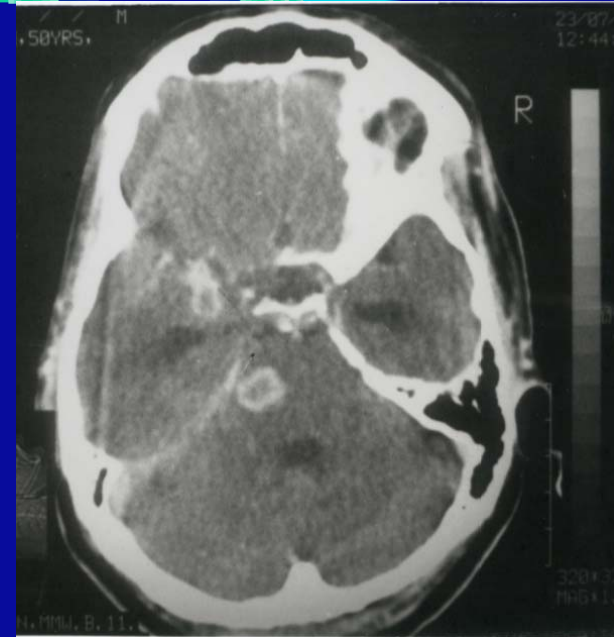
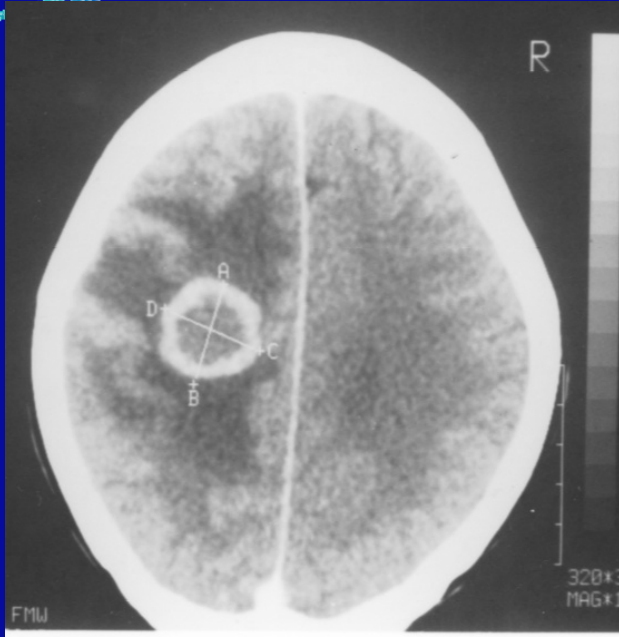




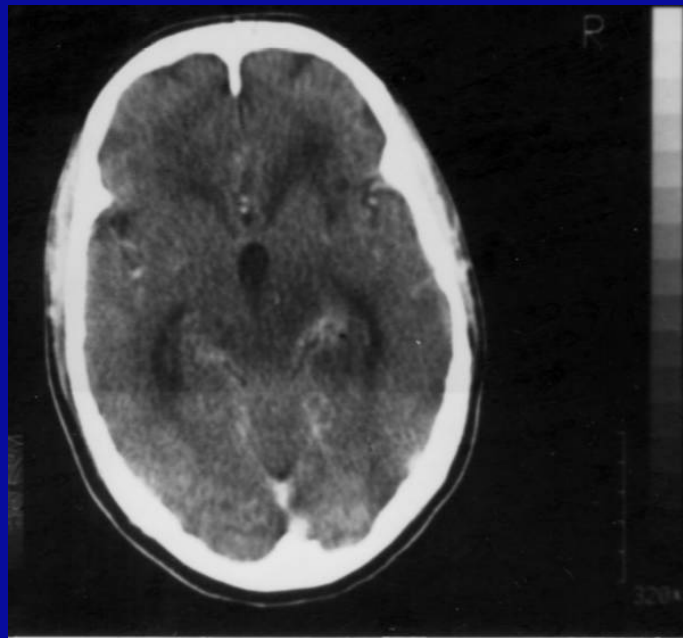
# Immune reconstitution inflammatory syndrome (IRIS)



# TUBERCULOMA



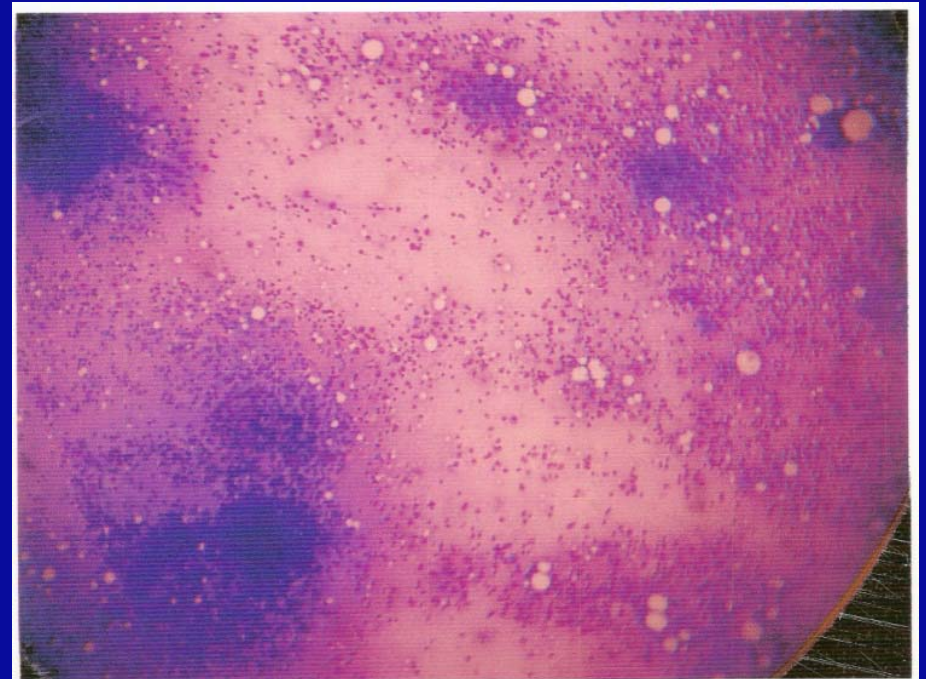
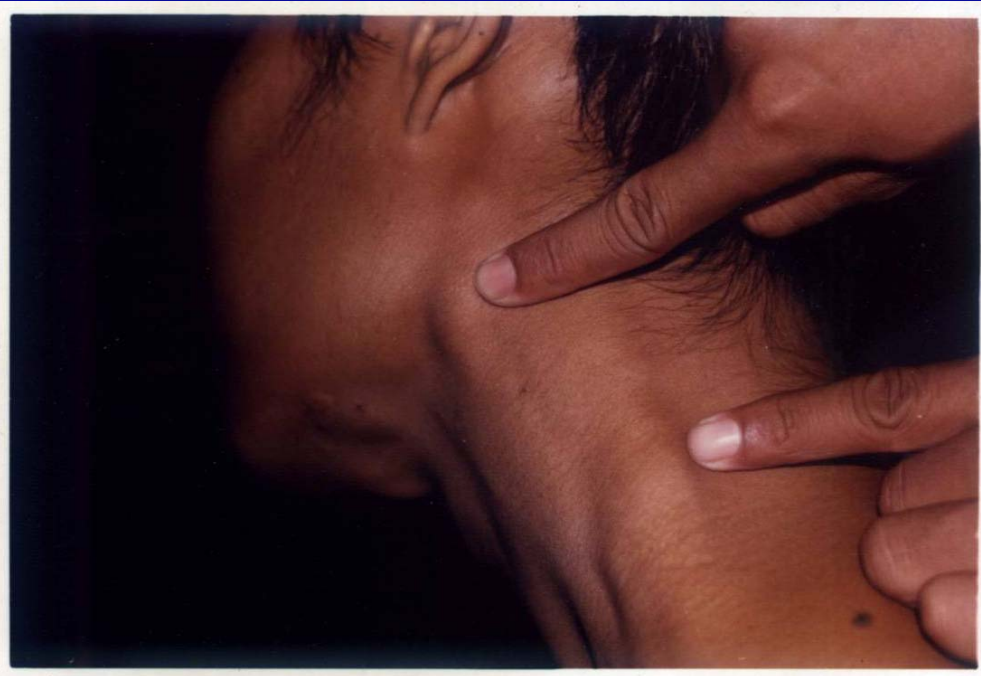
Basal meningitis with obstructive hydrocephalus





## Tubercular Lymphadenopathy

Caseating necrosis  
(FNAC of cx. lymph node)  
(Giemsa stain)



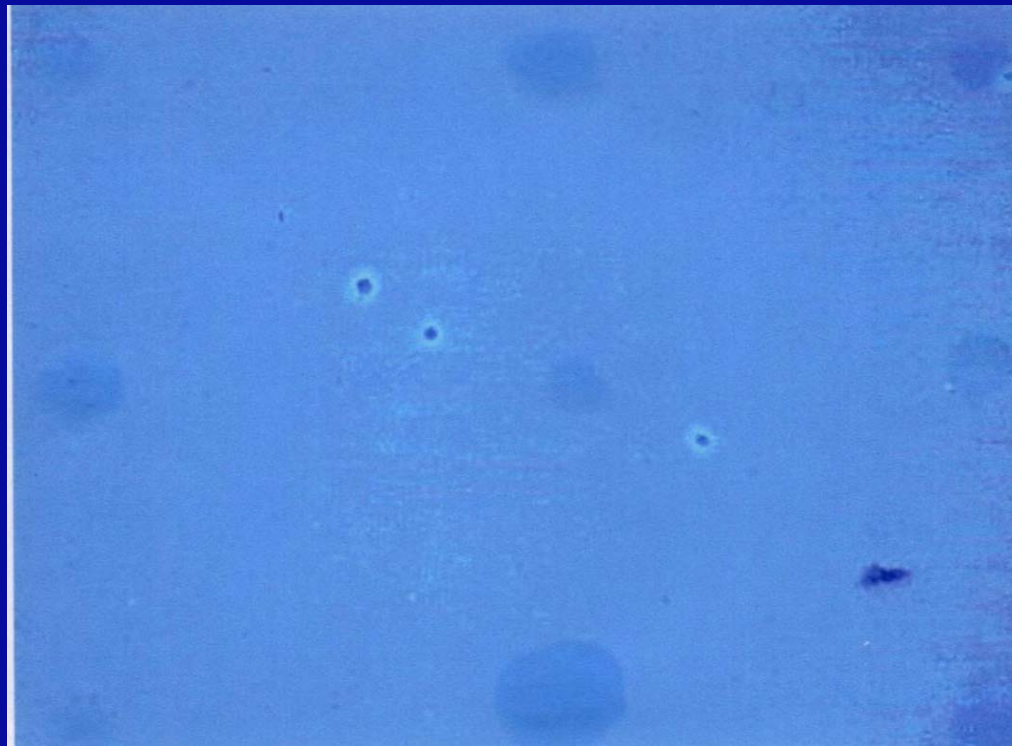
# Sputum showing AFB

(Z.N. stain)

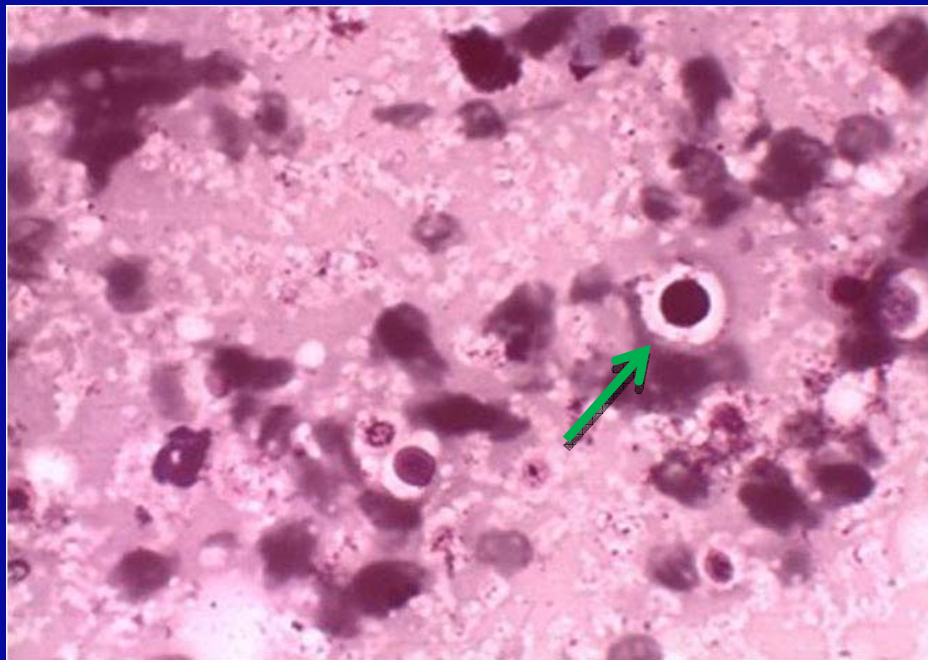


# **Cryptococcus neoformans**

**CSF (India ink)**



## FNAC of cervical lymph node (Giemsa stain)

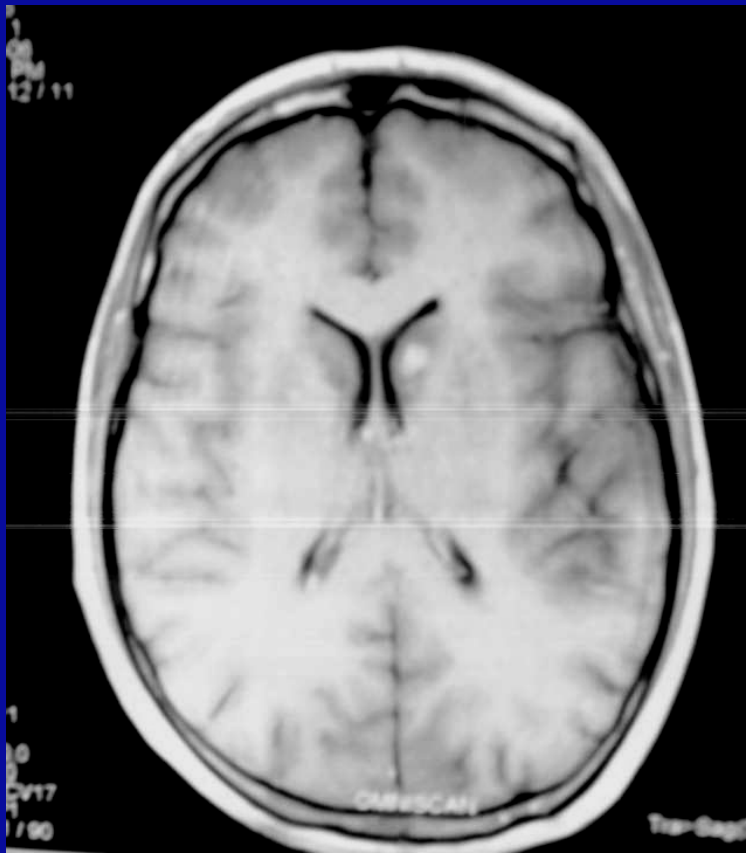


## SDA medium showing growth of cryptococcus

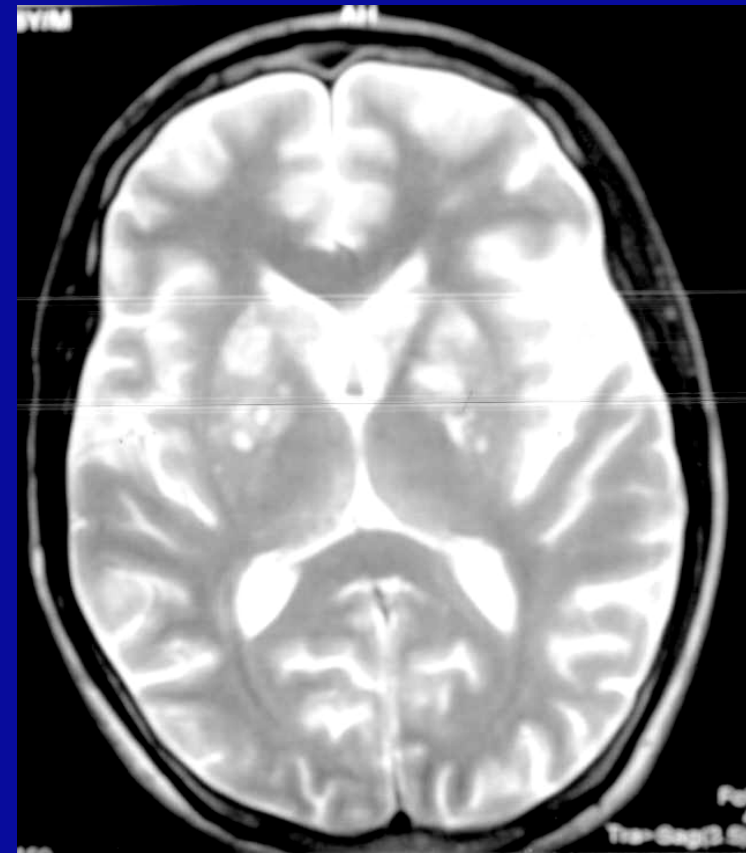




# MRI of Brain showing Cryptococcoma



FLAIR

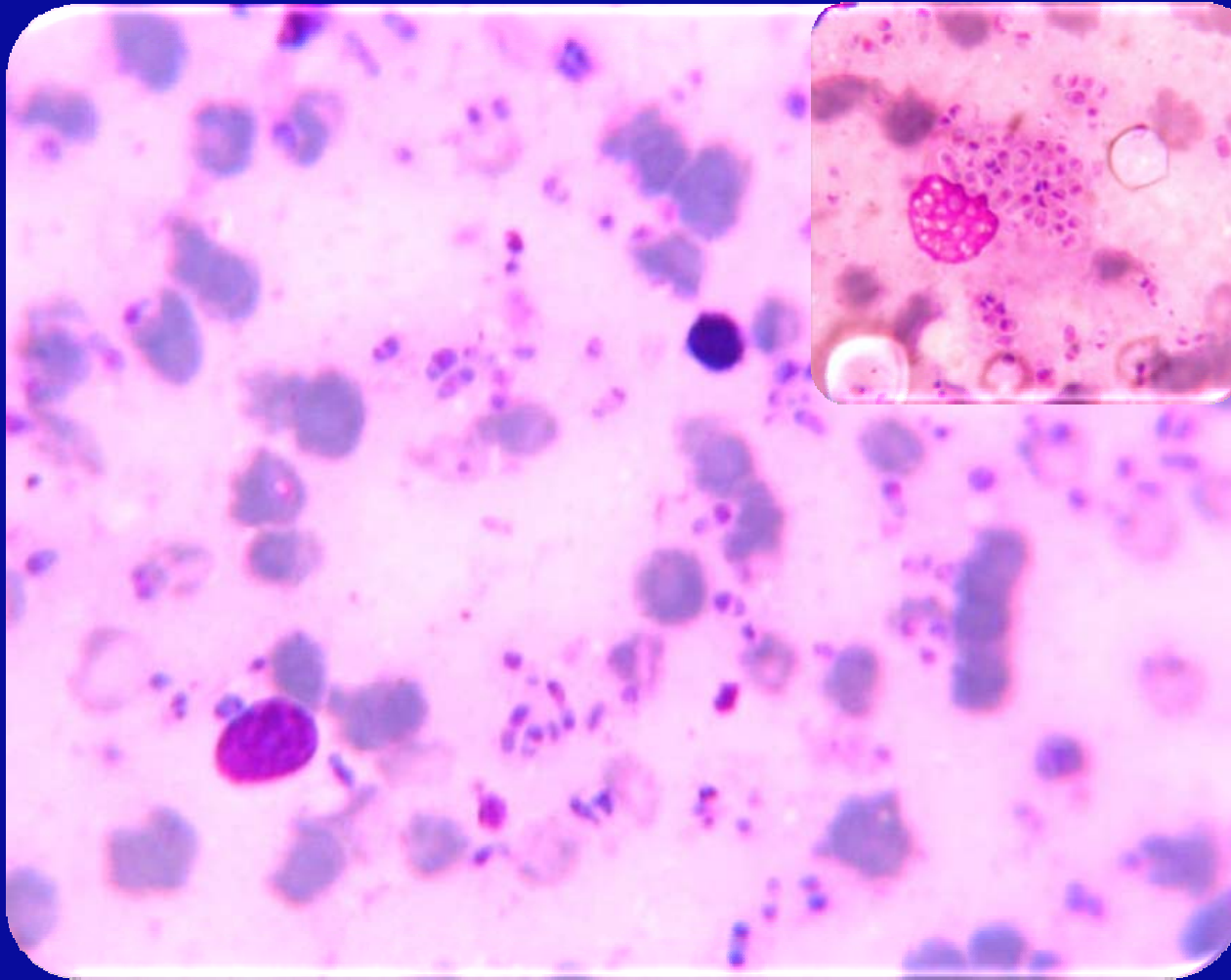


T2W I

## Cutaneous penicillosis



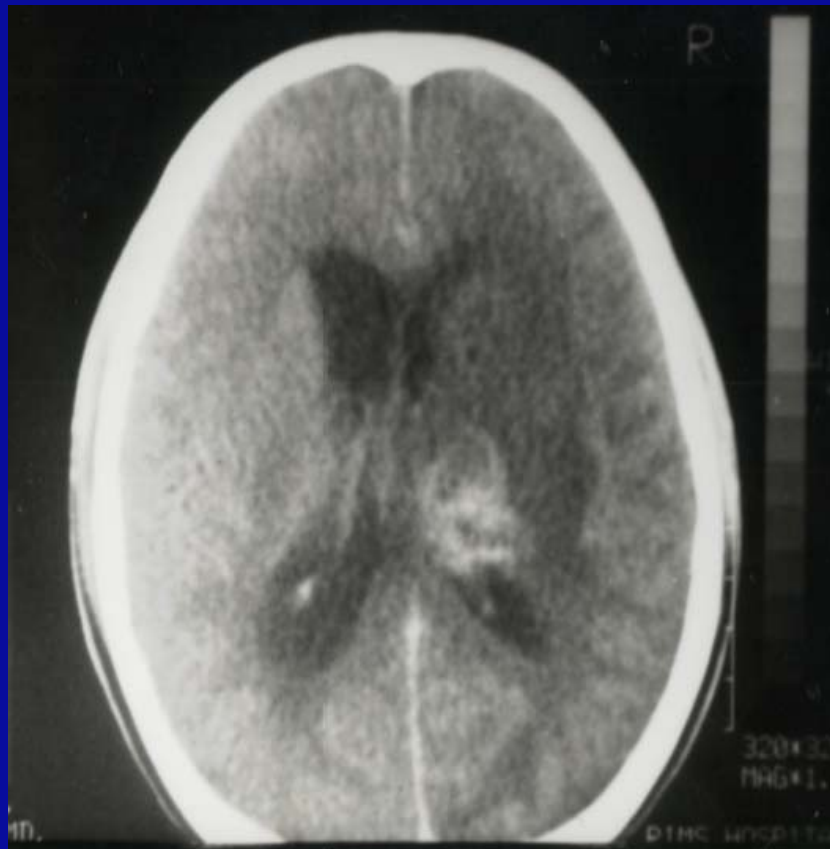
**Giemsa stain showing *Penicillium marneffei***



**SDA medium at 25° C showing diffusible red pigment.**

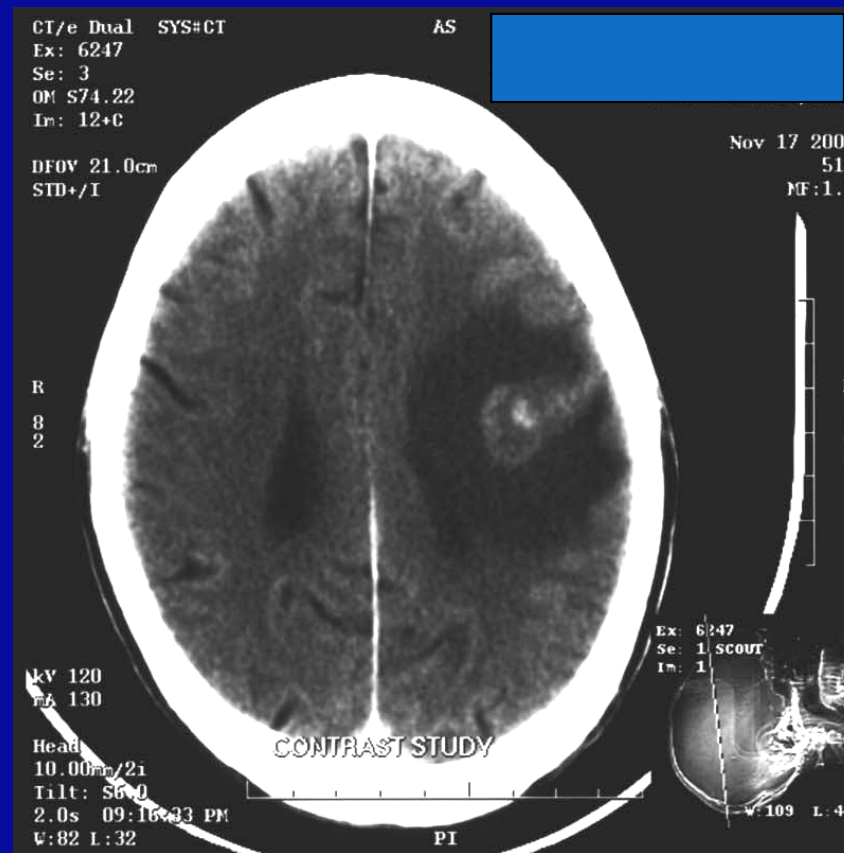


## C.T. Scan of Brain showing Toxoplasmosis





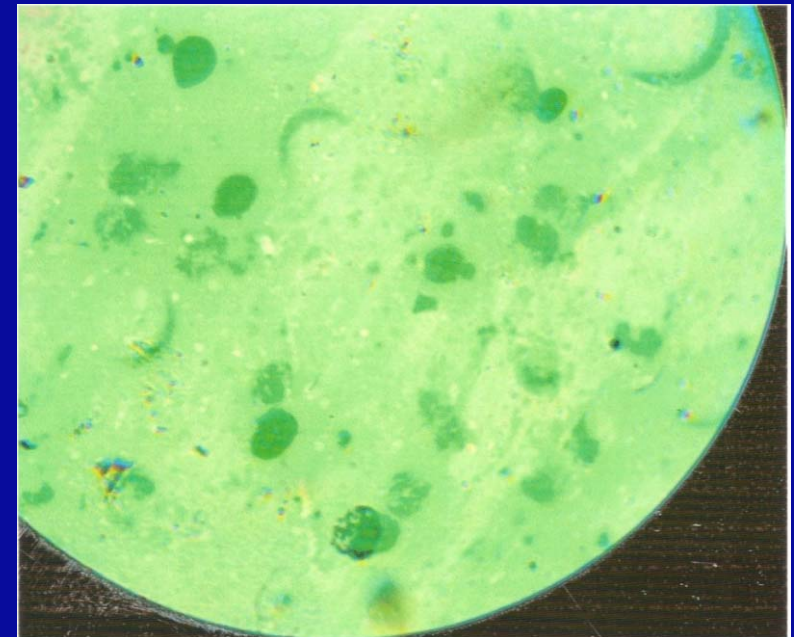
# C.T. Scan of Brain showing signet ring (toxoplasmosis)



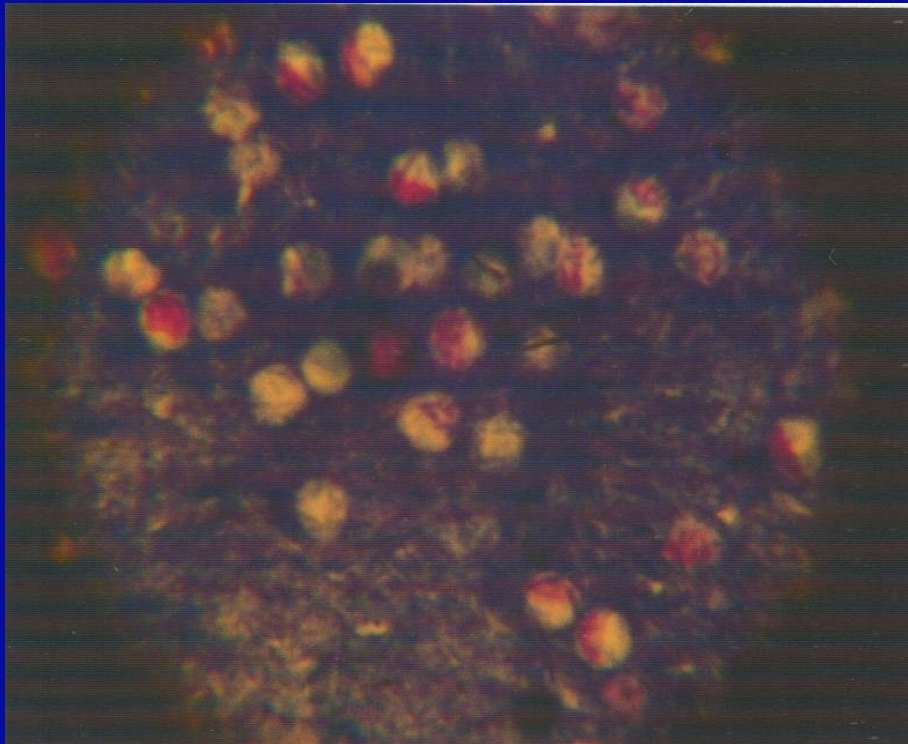
**Bacterial Pneumonia (Gram stain)**



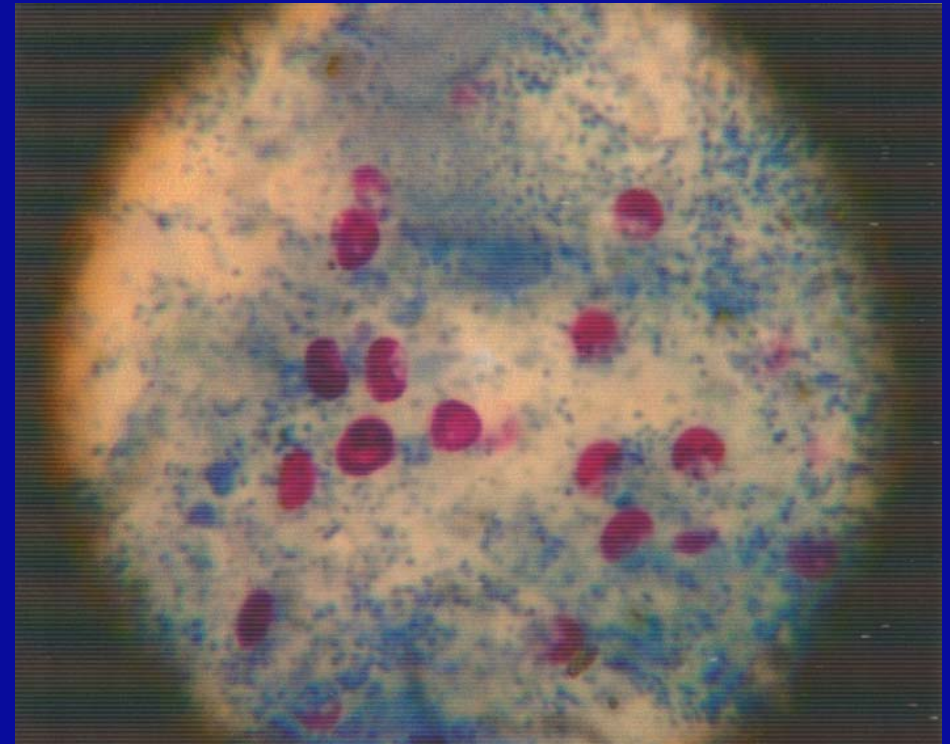
**Sputum showing PCP  
(MS Stain)**



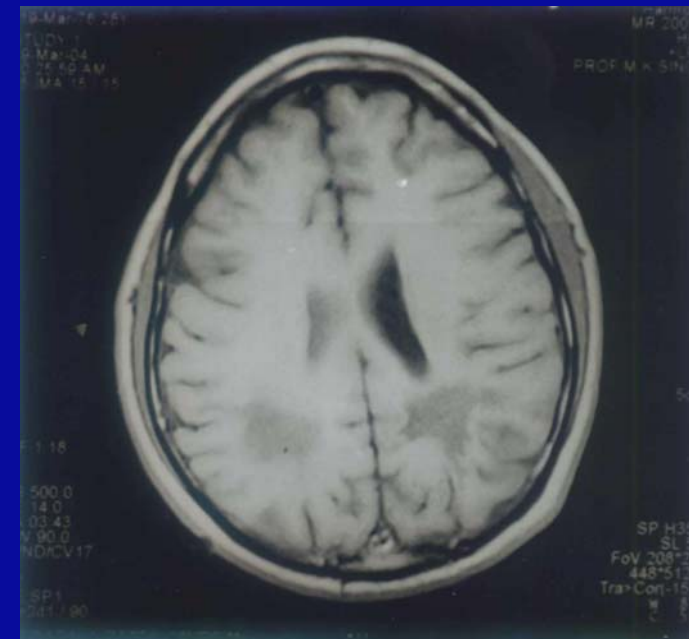
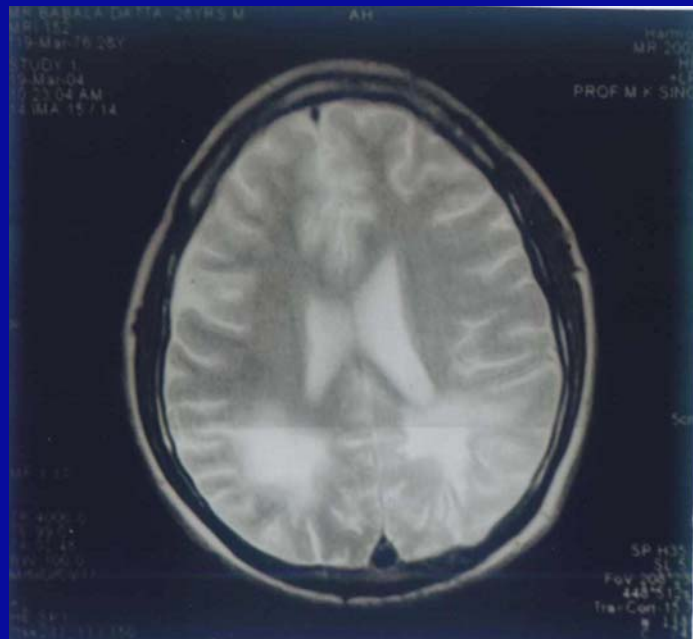
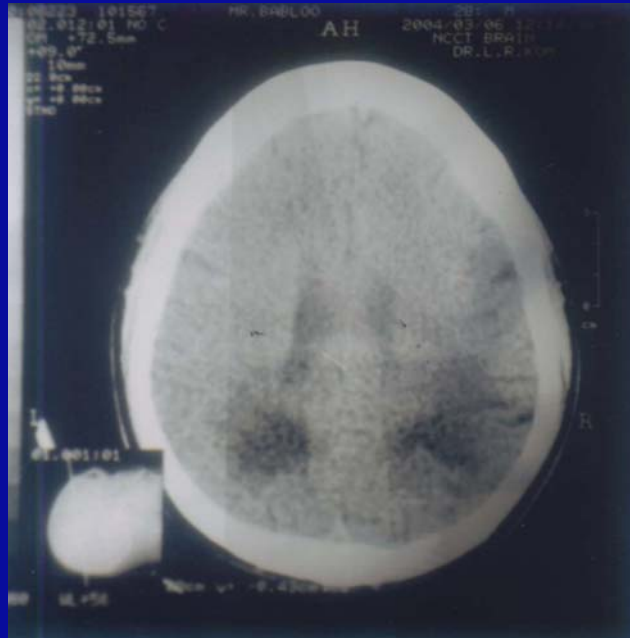
**Cyclospora oocysts (x100)**  
**(modified Ziehl-Neelsen stain)**



**Cryptosporidium oocysts (x100)**  
**(modified Ziehl-Neelsen stain)**



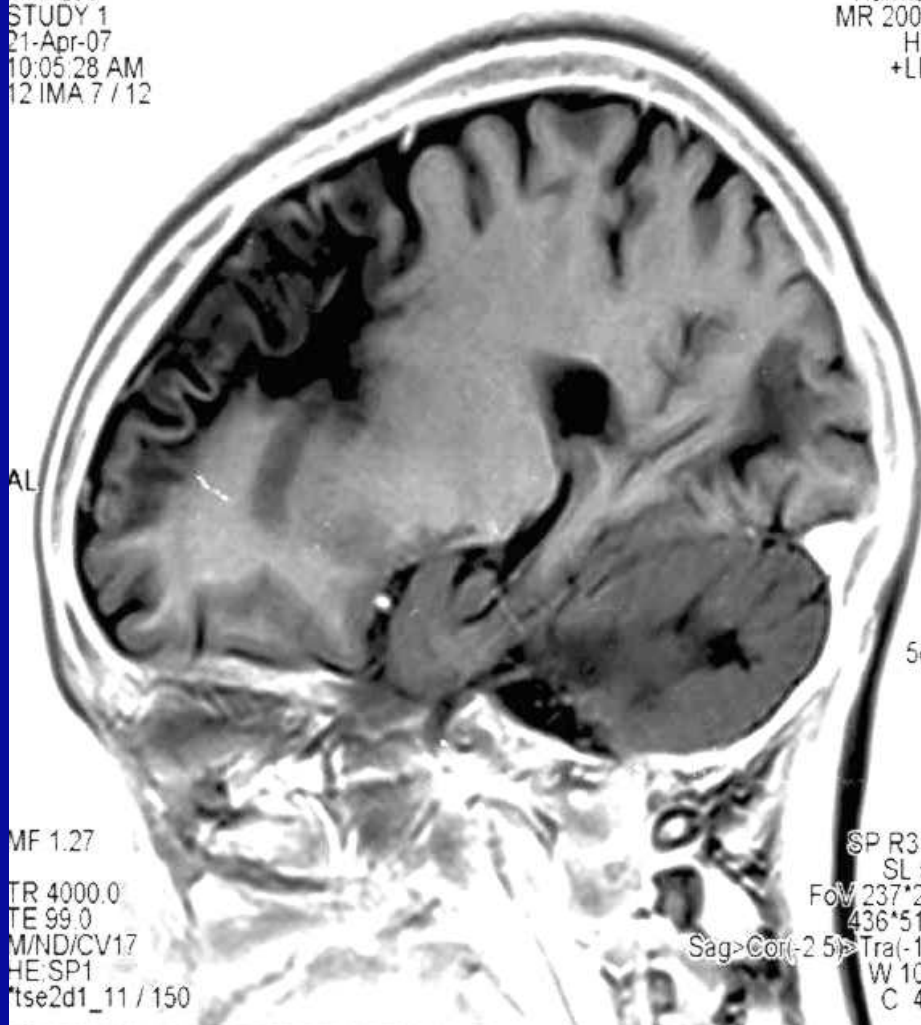
# CT & MRI showing PML



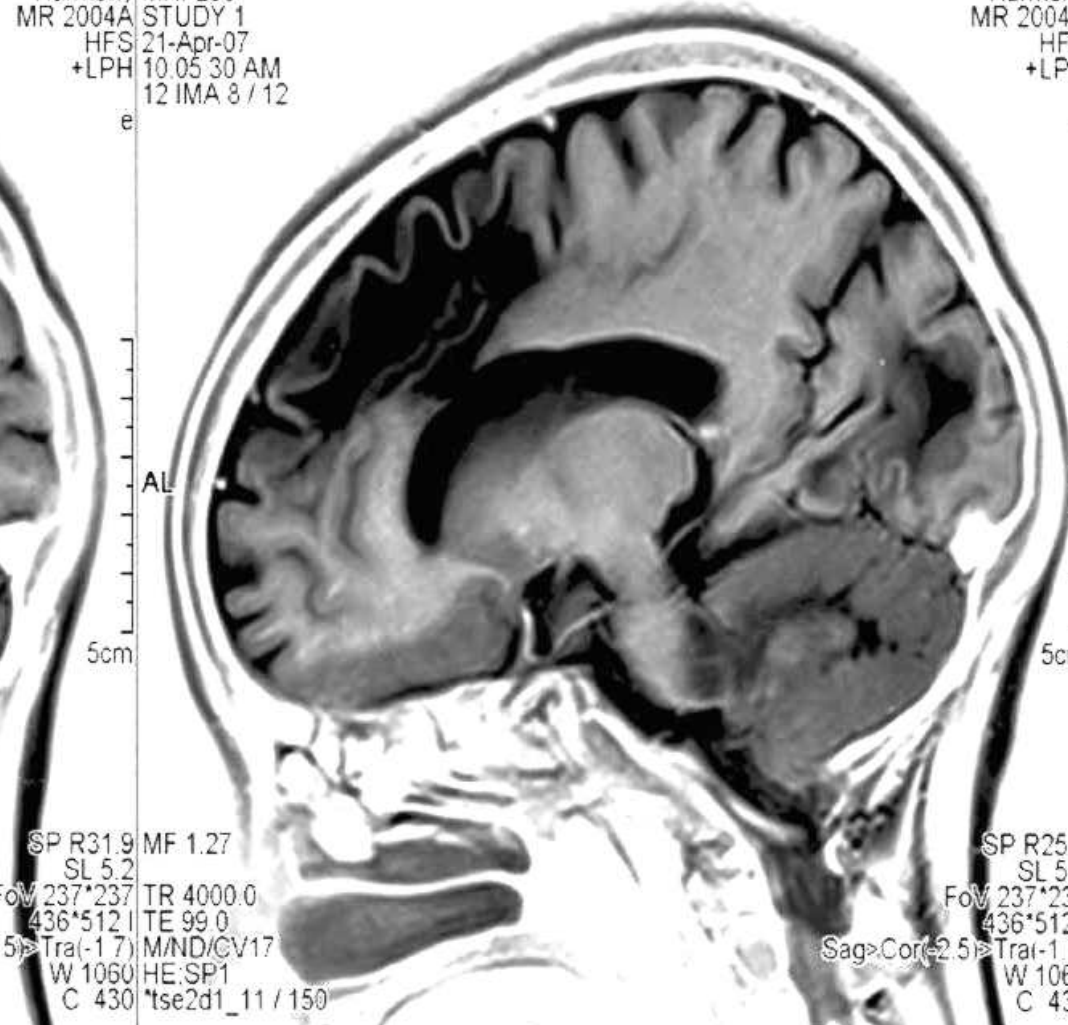


# T<sub>1</sub> W SAGITTAL MRI (PML)

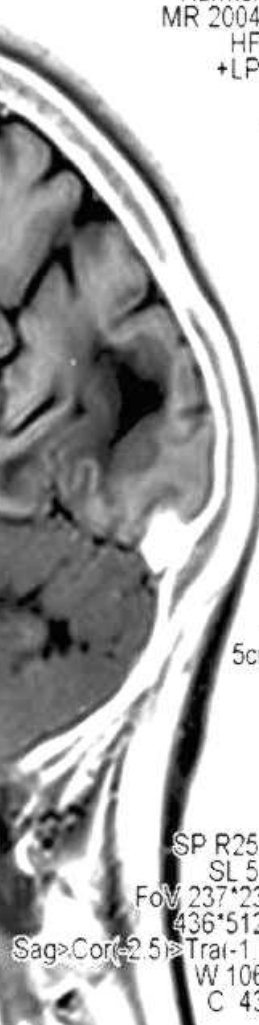
MRI-258  
STUDY 1  
21-Apr-07  
10:05:28 AM  
12 IMA 7 / 12



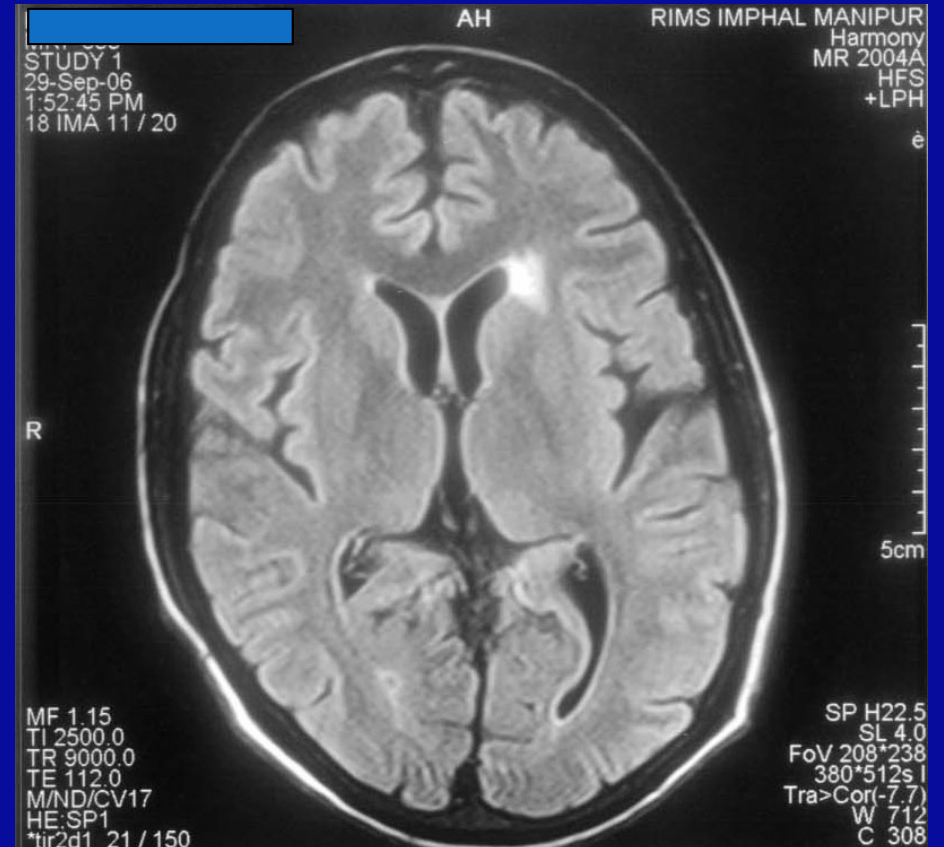
Harmony  
MR 2004A  
HFS  
+LPH  
MRI-200  
STUDY 1  
21-Apr-07  
10:05:30 AM  
12 IMA 8 / 12



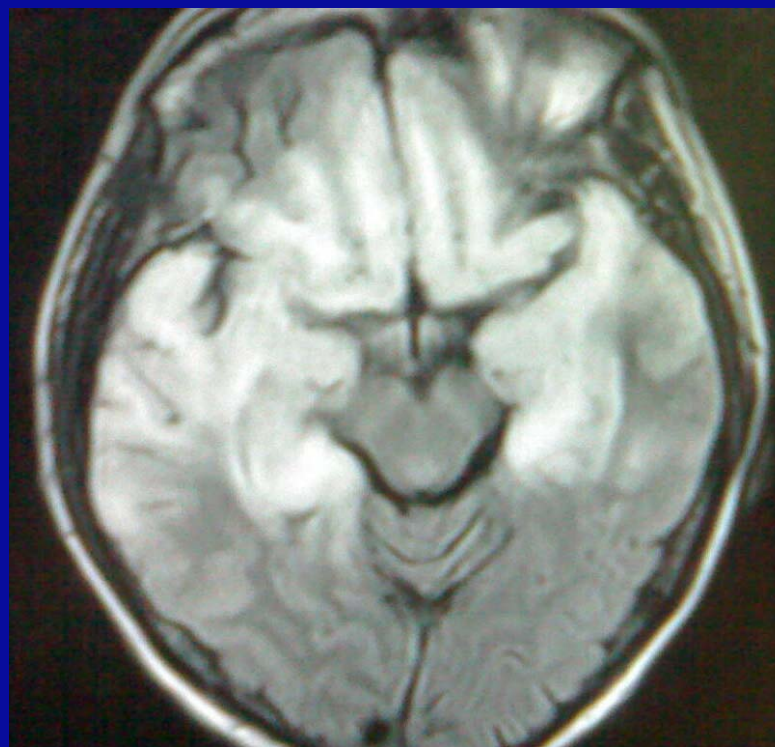
Harmony  
MR 2004A  
HFS  
+LPH



# MRI of Brain showing PML



## MRI showing Herpes simplex encephalitis





## Skin lesion of Herpes Zoster

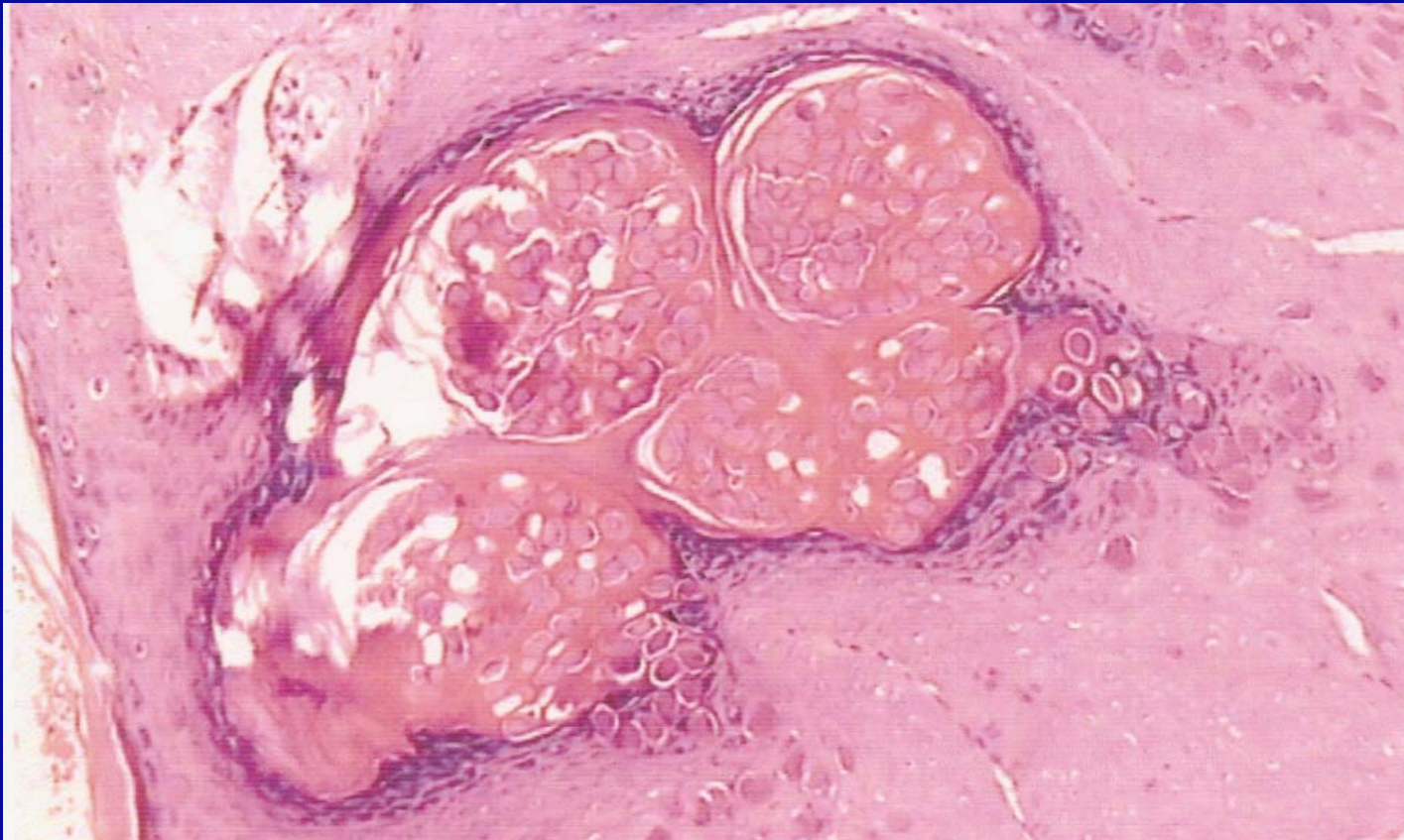




## Molluscum contagiosum



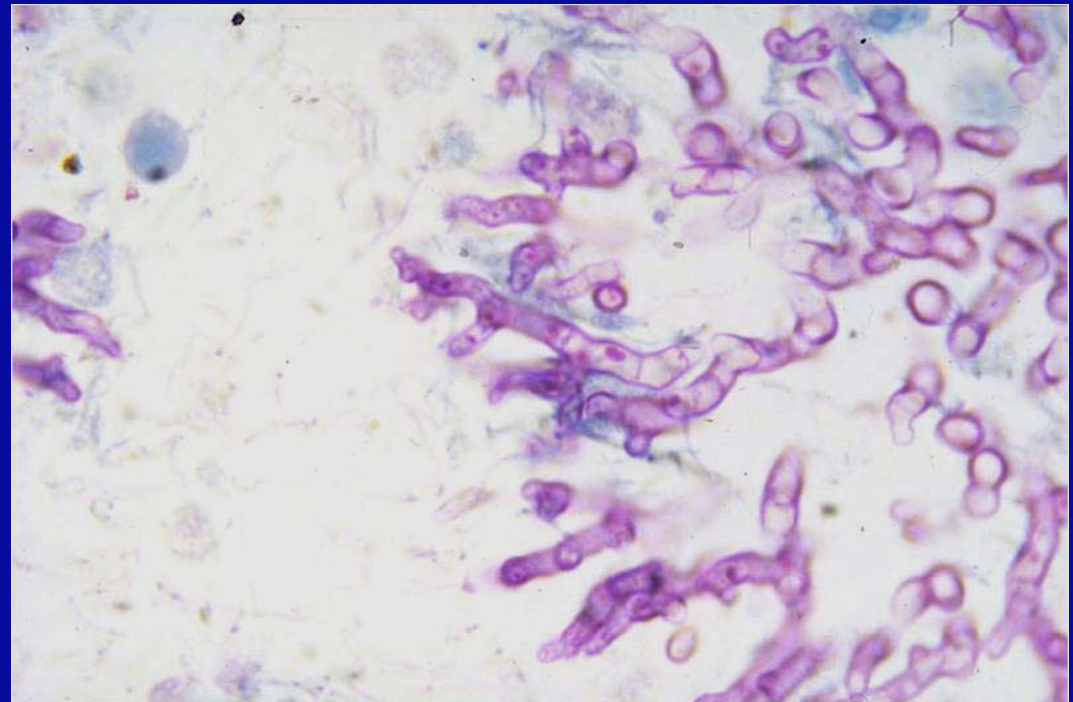
## Molluscum bodies (H & E Stain)



## Aspergilloma

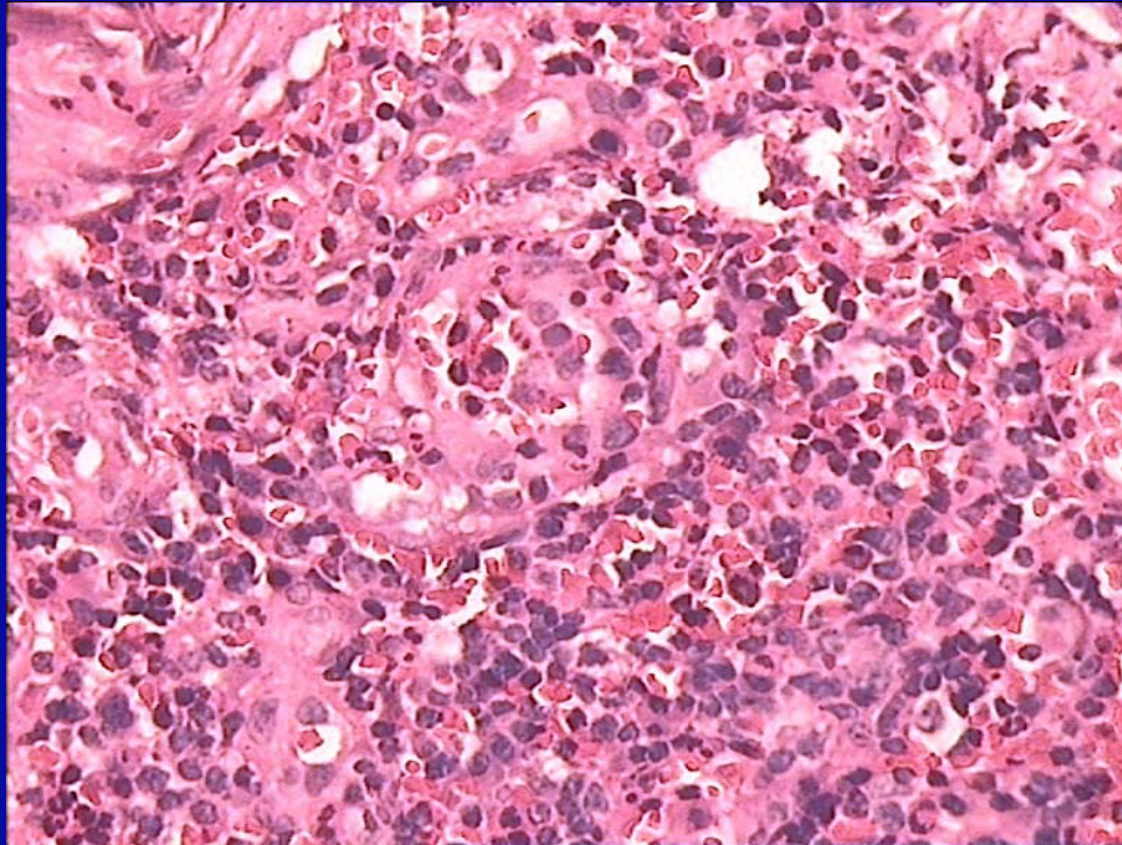


## Sputum showing Aspergillus (L.C.B. preparation )

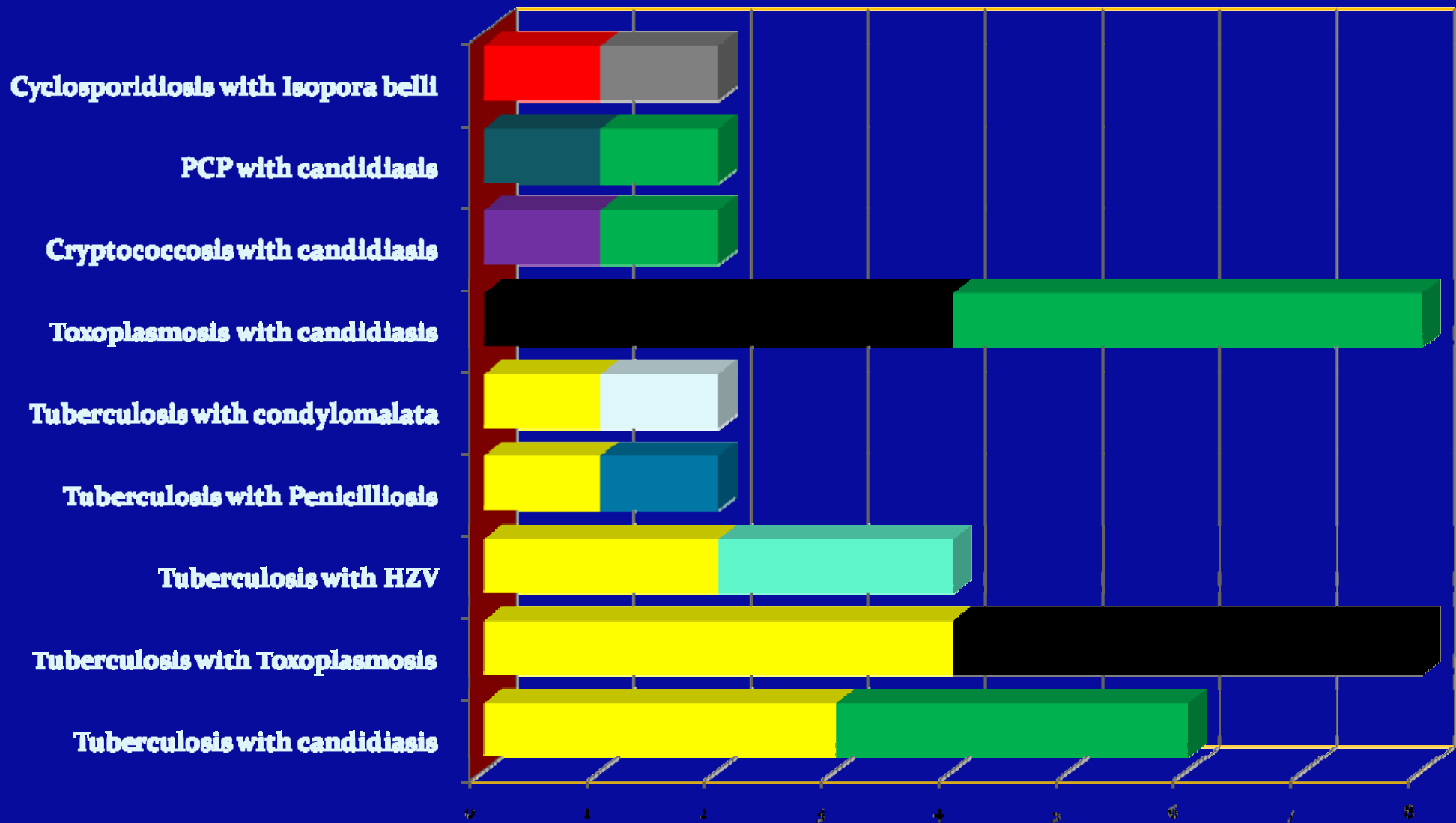




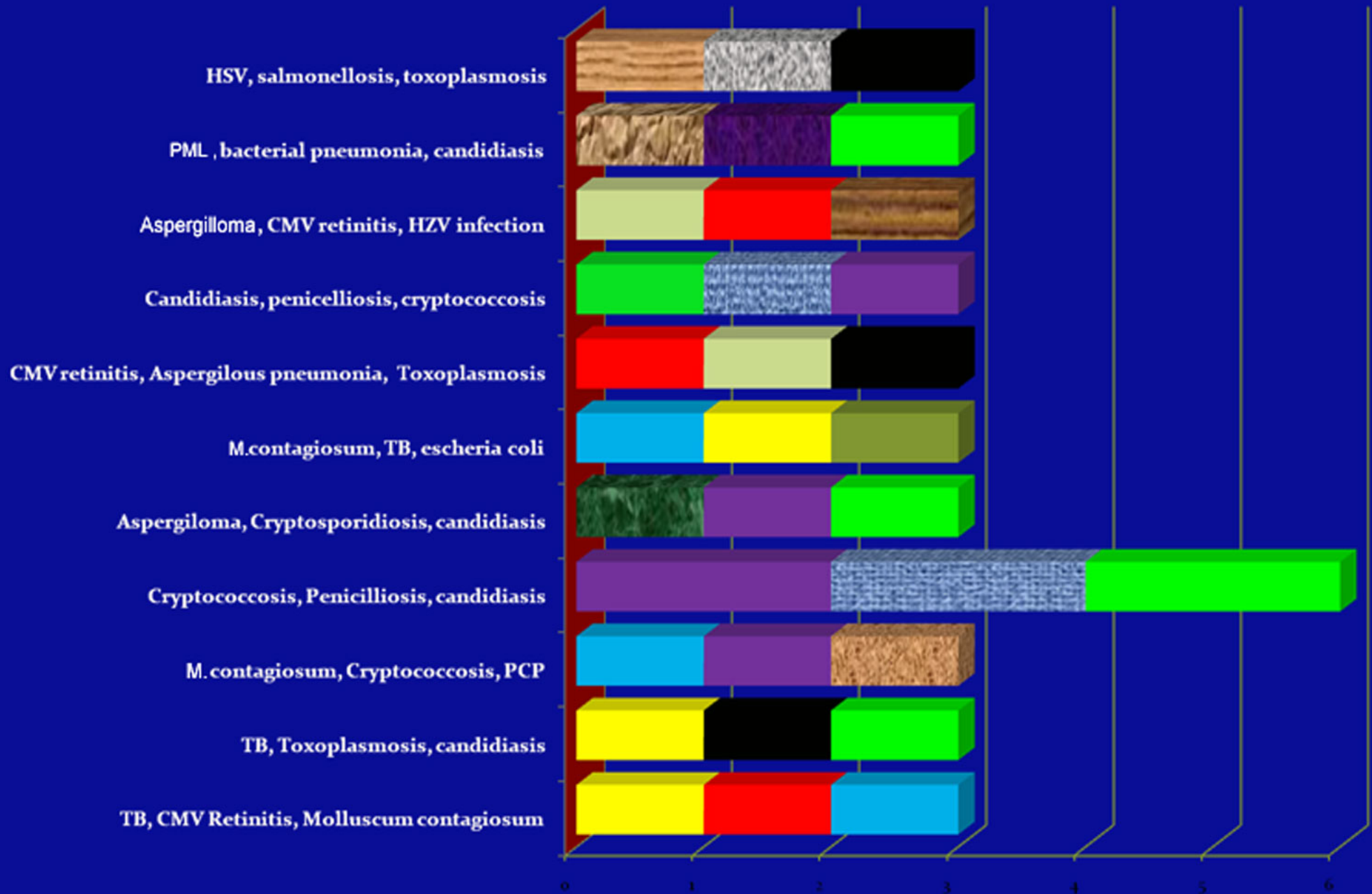
**Endarteritis obliterans of Condyloma lata  
(H & E stain)**



# Distribution of concomittant two OIs



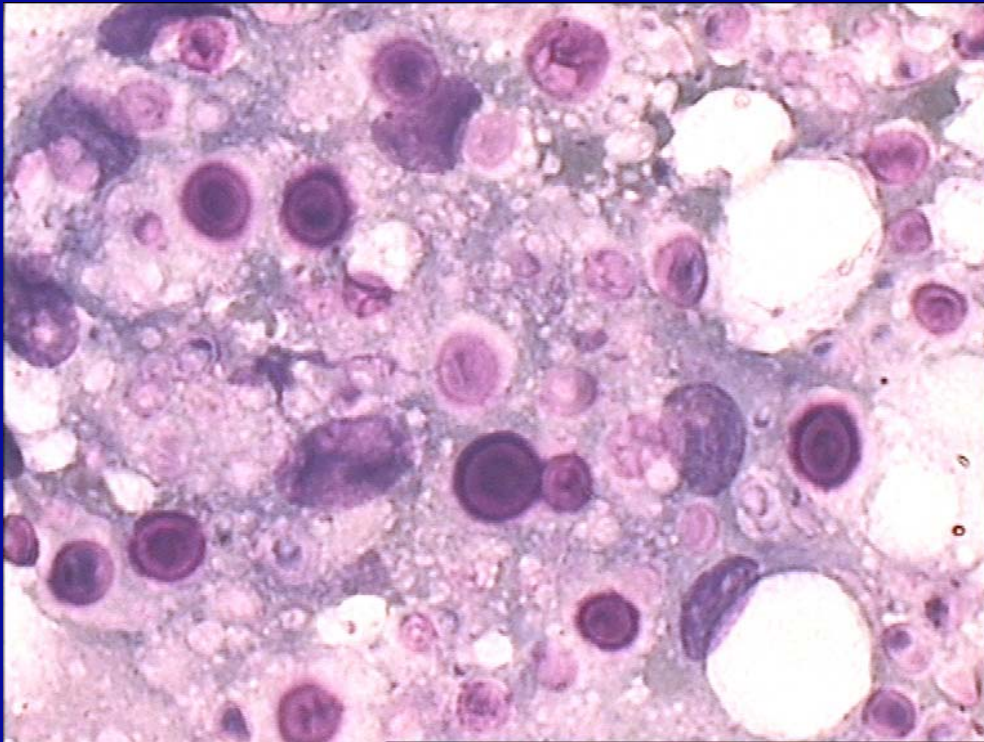
# Distribution of concomittant three OIs.



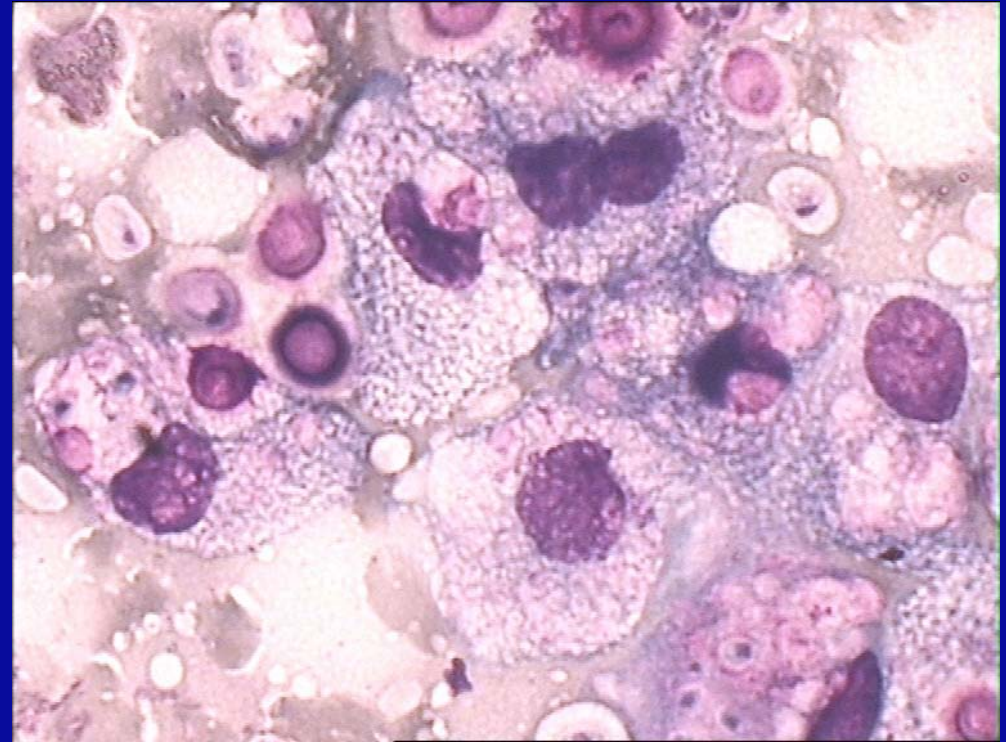


## Concomitant 2 Ols & 3 Ols.

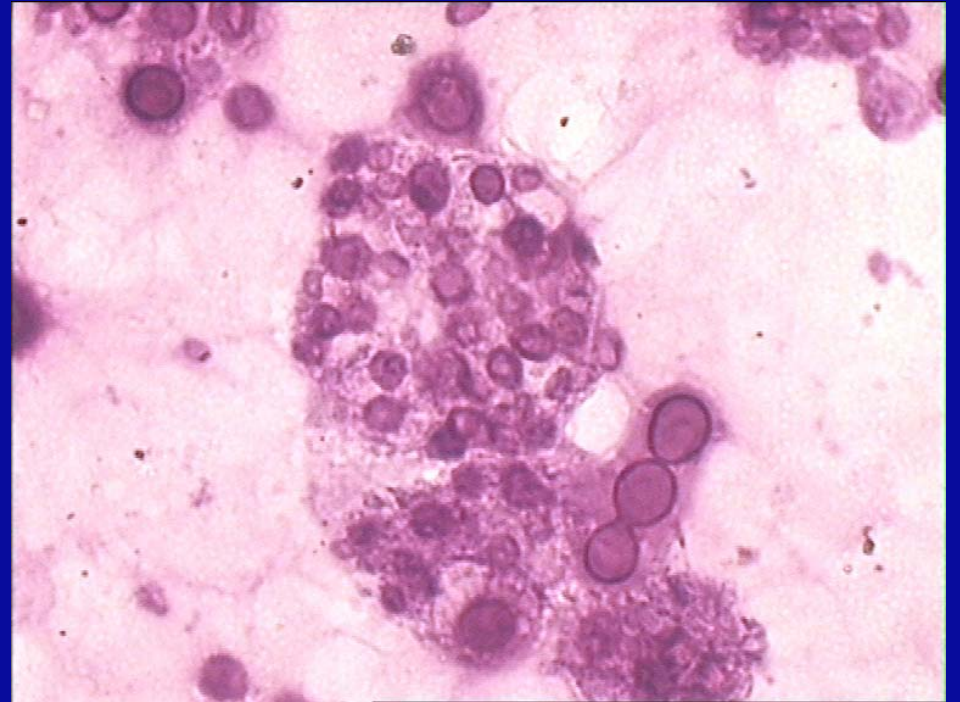
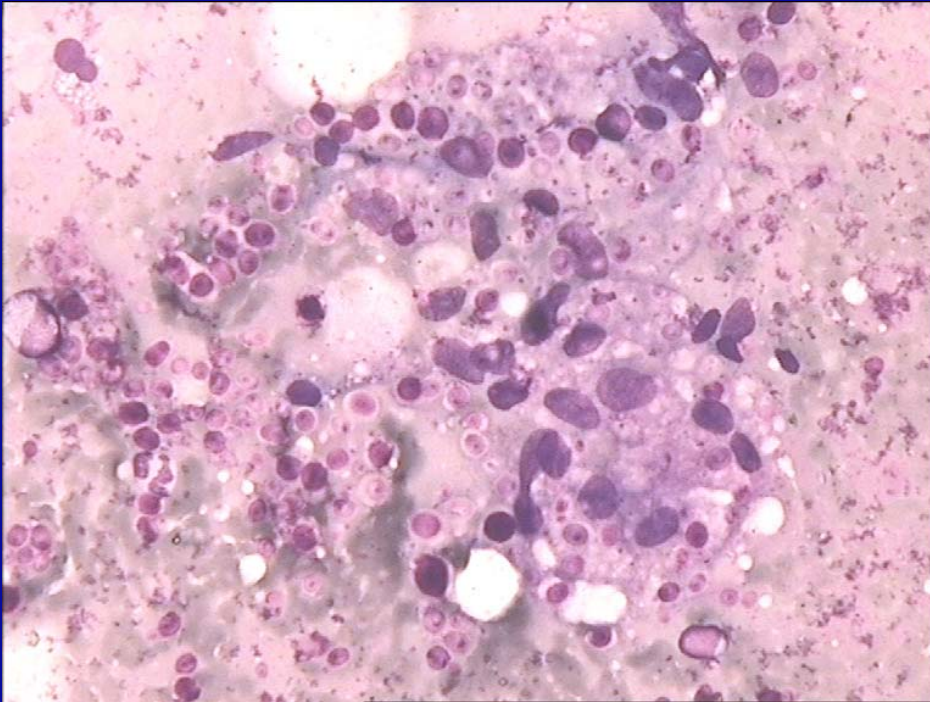
**Crypto & *P. marneffei***  
**(Giemsa stain)**



**Crypto, Candida & *P. marneffei***  
**(Giemsa stain)**



# Candida & P.marneffeii





# DISCUSSION

- No. of HIV 33.2 million Dec. 2007 (global)  
2.5 mill. 2006 (India)  
23694 till May 2008 (187827) (Manipur)
- 1<sup>st</sup> case of AIDS – 1981 from homosexual (USA)  
1987 (CSW) – Mumbai, India  
1990 (IDUs) – Manipur
- Major risk factors – heterosexual – India
- IDUs – Manipur

- IDUs (37.6%) – heterosexual (31.1%), spouse (29.8%)
- ↑No of spouse infected from positive husbands
- Overlapping of IDUs & selling sex - not practiced
- Incidence of OIs differ from one geographic area to other
- TB → Candida → PCP → Cerebral toxoplasmosis → Kaposi's sarcoma (Misra SN. 1998, Northeastern India)

- TB → Candidiasis → cryptosporidial diarrhoea → herpes zoster → toxoplasmosis → bacterial infections → PCP → cryptococcal meningitis → Kaposi's sarcoma → herpes simplex → coccidioidomycosis → PGL → LIP → OHL (NACO 2003, India)
- Candidiasis → TB → Enteropathogenic vibrio → CMV → parasitic infections (India. ICMR 2008)
- Oral candidiasis → TB → Enteropathogenic vibrio → CMV → cryptosporidial diarrhoea → E. coli (Eastern part of India. Nilanjan Chakraborty 2008)

- Extra pulmonary TB → cryptococcosis → *P. marneffe*  
(Duong TA. 1996, Thailand & South east Asia)
- TB - chronic diarrhoea – bacteremia due to salmonella  
typhimurim, streptococcus pneumoniae (African AIDS.  
Peter Piot 2000)
- Candidiasis → PCP → TB → Systemic mycosis → Viral  
skin lesion (China. 2007, Wang XC)



- Tuberculosis → PCP → toxoplasmosis → cryptococcosis (2003 Veeranoot, Malaysia)
- PCP → CMV (Lip C & Yesh EK 1995, Hongkong Japan, Taiwan, Singapore)
- PCP → esopharyngeal candidiasis → disseminated mycobacterium avium complex (USA Kaplan JE 2000)
- Candidiasis → TB → cryptococcosis → penicilliosis → protozoal infection → toxoplasmosis (Our study 2005-2007, Manipur)

➤ CD<sub>4</sub><sup>+</sup> T cell count ranged from 6-212 with a mean of 94 cells/mm<sup>3</sup>.

➤ CD<sub>4</sub><sup>+</sup>T cell count for

2 concomittant OIs → 35-98 cells/mm<sup>3</sup>

3 concomittant OIs → 6-60 cells/mm<sup>3</sup>

# CONCLUSION

- Manipur has ↑ no. of HIV/AIDS – ↑ IDUs
- OIs varies in different parts of the world
- CD<sub>4</sub>+T cell count ↓ → multiple OIs
- To ↓ morbidity and mortality – integrated approach with clinicians, microbiologists, pathologists, radiologists

- NACO → training of clinicians, laboratory personnels for diagnosis & management of HIV/AIDS
- Physicians caring HIV/AIDS – general medicine & HIV related OIs
- Timely treatment – (ART, OI, prophylaxis) save lives of PLHA



**Physicians**

**Microbiologists**

**Pathologists**



**Radiologists**

# Acknowledgement

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THANK YOU