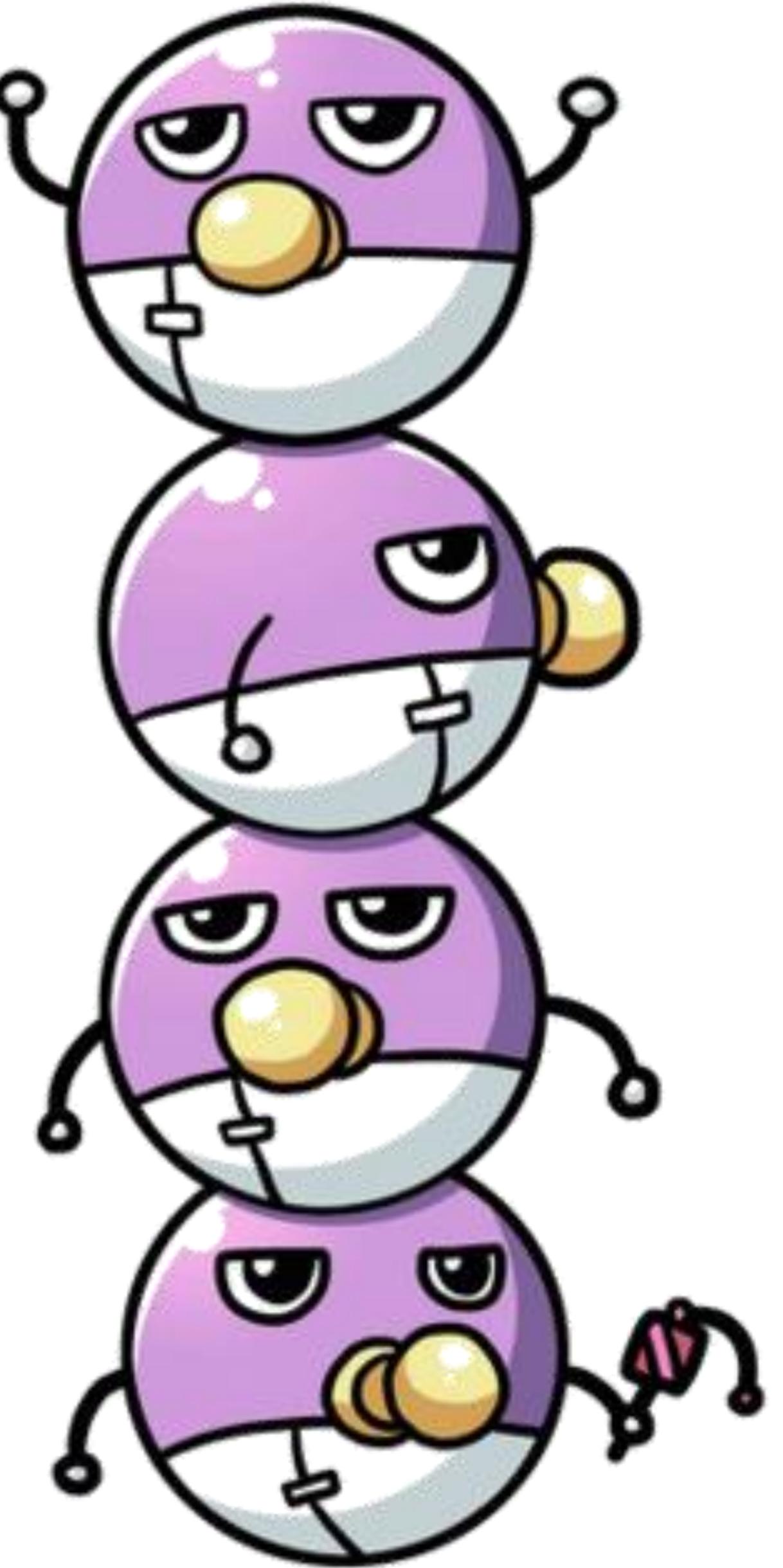


Interesting case

7th floor ward
November 2023



Patient profile

ผู้ป่วยเด็กชายไทย อายุ 25 วัน

เชื้อชาติไทย สัญชาติไทย ภูมิลำเนา อ.บ้านสร้าง จ.ปราจีนบุรี

ข้อมูลได้จาก มาตร达และใบสั่งต่อการรักษา ความน่าเชื่อถือสูง

Chief complaint

ไข้ ซึมลง 2 วันก่อนมา รพ.

Present illness

- 2 วันก่อนมาพ. (19/10/66) [DOL23]
ช่วงกลางวัน มาเรดาสังเกตว่ามีอาการท้องอืด **ดูดน้ำได้น้อย** หลังจับเรอและพยายามแล้วอาการท้องอืดดีขึ้น
ช่วงบ่าย มีอาการ**ตัวร้อน วัดไข้ทางรักแร้ได้ 38 องศาเซลเซียส**
ช่วงเย็น ไข้ลง อาการท้องอืดดีขึ้น ดูดน้ำได้ปกติ กลับมาร้าเริงปกติ ยังไม่ได้ปรึกษาที่ใด
- 5 ชั่วโมงก่อนมาพ. (21/10/66) [DOL25]
ตัวร้อน วัดไข้ได้ 39 องศาเซลเซียส ร้องคราง ตาลาย หายใจเร็ว หายใจออกบุ้ม
ไม่มีอาการไอ/น้ำมูก/เสมหะ/หายใจครีดคราด ไม่มีถ่ายเหลว/อาเจียน ไม่มีอาการซัก ขยายแขนขาเท่ากัน
สองข้าง ปัสสาวะยังออกดี ตอนเช้าจึงพาไปคลินิกกุมารแพทย์ แพทย์สงสัยภาวะติดเชื้อจึงให้มารพ.

Past history

- Term male newborn, G1P0 GA 38+3 wk, C/S due to CPD (26/9/66), APGAR 9,10
BBW 3,240 g, AGA , HC 35 cm (P50) , Lt 52 cm (P75)
- No complications, กลับบ้านพร้อมมารดาที่ 48 ชม., BW at D/C 3,100 gm
- ประวัติระยะคลอด : márดาเจ็บครรภ์คลอดตอนครูบกำหนด, ไม่มีน้ำเดิน, ไม่มีตกขาว,
ไม่มีแพลทีอวัยวะเพศ, ไม่มีไข้ก่อนคลอด
- márดาฝากครรภ์สำมำเสมอ **serology; VDRL : non reactive , Anti-HIV : negative , HBsAg : negative , Anti-HCV : negative**

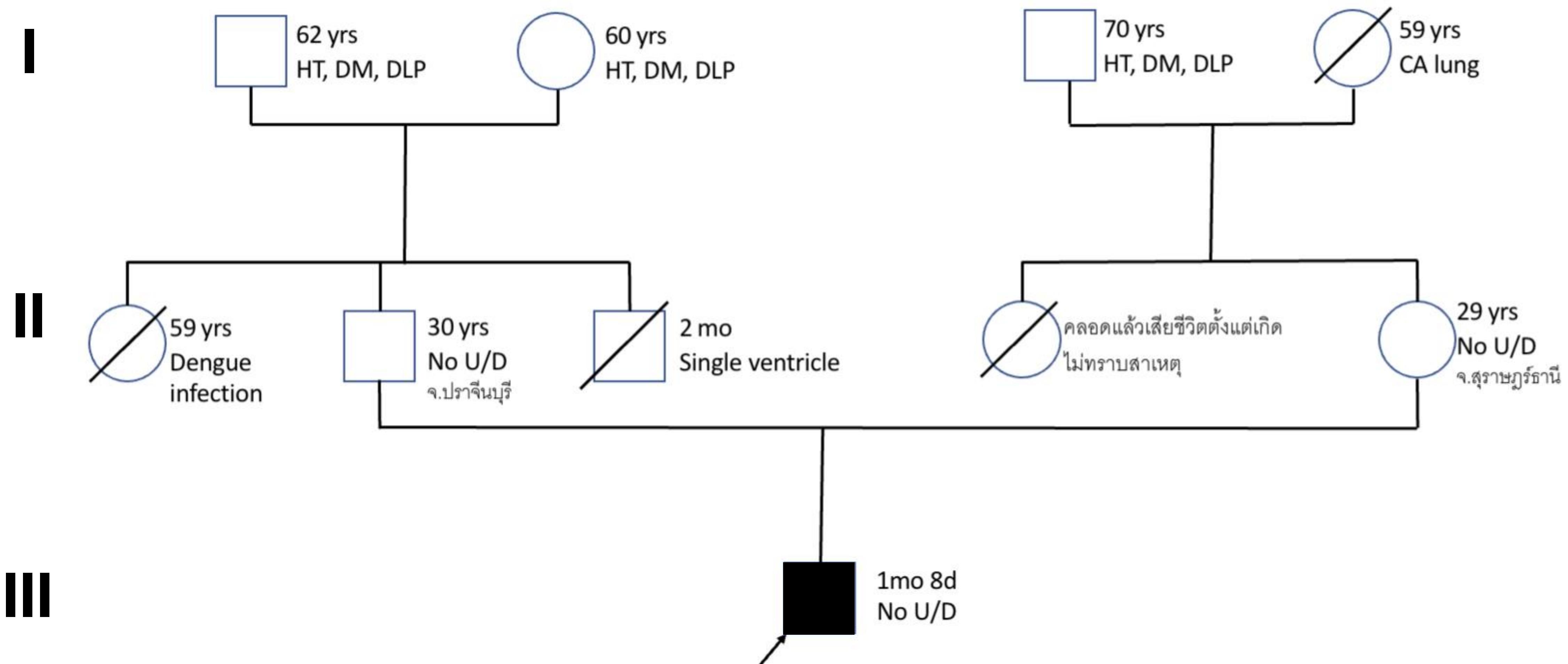
Personal history

- Vaccination : BCG, HBV vaccine at birth
- Development : แขนสองข้างบั้งเท่ากัน ยังคลายมือไม่สุด หันตามเสียง ส่งเสียงจากลำคอ จ้องหน้ายิ้มหัวเราะ ได้
- Feeding : เข้าเต้า 2 ข้าง ต่อด้วยนมแม่ผ่านช่วงนม 3 ตอนซึ่ง ต่อครึ่ง ทุก 3 ชม. วันละ 7-8 ครั้ง ใช้น้ำยาล้างช่วงนม ต่อด้วยต้มน้ำเดือด ปั๊มน้ำมารดา นำนมเข้าตู้แช่ อุณหภูมิ -18 องศาเซลเซียสทันที เก็บนานที่สุด 3 วัน

Family history

- บิดา อายุ 29 ปี ไม่มีโรคประจำตัว/ไข้ยาประจำ หมู่เลือด AB+
 - ผลเลือด(5/2/66) Hb 13.2, Hct 40, Hb typing : A2A (Hb A2/E 2.9%, HbF 0.5%), OF test- neg., DCIP- neg.
 - Anti-HIV- neg., HbsAg- neg., VDRL- non-reactive
- มารดา อายุ 28 ปี ไม่มีโรคประจำตัว/ไข้ยาประจำ หมู่เลือด A+
 - ผลเลือด(5/2/66) Hb 12.8, Hct 38, Hb typing : A2A (Hb A2/E 2.6%, HbF <1.0%), OF test- neg., DCIP- neg.
 - Anti-HIV- neg., HbsAg- neg., VDRL- non-reactive
- ประวัติคนในบ้านเป็นวัณโรค / สูบบุหรี่ / ดื่มเครื่องดื่มแอลกอฮอล์ / ใช้สารเสพติด

Pedigree



Physical examination

- General appearance : **look ill, irritable, weak cry**, no cyanosis
- **BW 4,210 g (P90), Lt 54 cm (P75), HC 37 cm (HC85-P97)**
- V/S : **BT 37.7 C (at ER 38.9 C), PR 172 /min**, RR 52 /min, BP 101/56 mmHg,
SpO₂ 100% RA
- Skin : **generalized mottled skin** , no rash, no petechiae, no ecchymoses
- HEENT : **anterior fontanelle 2*2 cm, no bulging**, posterior fontanelle fingertip,
not pale, anicteric, no eye discharge, no dry lips, no sunken eyeballs, no
depressed fontanelles, pharynx not injected

Physical examination

- CVS : full pulse, **capillary refill 3 sec**, normal S1S2, no murmurs
- RS : no nasal flaring, **mild subcostal retractions**, clear equal breath sounds both lungs
- Abd : soft, no guarding, not distended, no palpable liver or spleen
- Genitalia : no phimosis, descended both testes
- Neuro : **Equal bilateral movements, no spastic tone , vertical suspension and horizontal suspension normal, no facial palsy, Brudzinski's and Kernig's sign negative, DTR 2+ all extremities, Clonus negative, BBK test not well evaluated**
- Ext : no edema, full ROM, no swollen joints, no sacral dimple, no rash or purpura

As a first doctor at ER please problem lists for access patient

Pertinent finding

Positive	Negative
Acute febrile illness for 2 days	Without localizing sign
Infant with toxic appearance	No history of maternal perinatal infection
Poor tissue perfusion	No history of first child neonatal sepsis
Sign of respiratory distress	

Problem list : A 25 days old male infant presented with fever without source with toxic appearance suspected sepsis

As a general pediatrician please initial management for this patient

Management in this patient

Fever without source

- ✓ Rectal temperature \geq 38 degree C
- ✓ Duration of fever < 1 week
- ✓ No source of infection found from history and physical examination

Age group : < 28 days

- ✓ Serious bacterial infection more common in young infant , but mostly from self limited viral infection
- ✓ **Bacteremia (11%) : S.pneumo, S .aureus, H.influenza, Salmonella**
- ✓ **Meningitis (4%) : S.agalactiae, E.coli, Klebsiella spp. , L.monocytogenes**
- ✓ **Urinary tract infection**

Admit and Complete work up : CBC , H/C , UA , Urine GS, UC , CSF analysis

Respiratory support : HHHFNC 8 LPM FiO₂ 0.40

Empirical Antibiotics : Cefotaxime and Aminoglycoside iv

Fluid resuscitation : NSS 10 ml/kg in 1 hr then MT+10%Def

Investigation in this patient

CBC	
Hb	11.3 g/dl (Mean 14 , -2 SD 10)
Hct	35 % (Mean 43 , -2 SD 31)
MCV	100 fl (Mean 104 , -2 SD 85)
WBC	4,540 /ul (5,000-21,000)
Neutrophil	33% ANC 1,498 (>1,000)
Lymphocyte	66% ALC 2,996 (>2,500)
Monocyte	3%
Eosinophil	3%
Basophil	0%
Platelet	251,000 /ul

Urinalysis (cath., clear, light yellow)	
Sp.Gr.	1.006
pH	7.5
Protein	Neg
Ketone	Neg
Blood	Neg
Leukocyte Est.	Neg
Nitrite	Neg
RBC	0 /HPF
WBC	0 /HPF
Urine gram strain	No organism

Blood sugar	88 mg/dl
CRP	108 mg/l (<10)
Hemoculture	Pending

Sepsis

Investigation in this patient

Appearance	Clear
RBC	330 /ul
WBC	440 /ul
Neutrophils	81%
Lymphocytes	19%
India ink	Neg
Glucose	11 mg/dl
Protein	367 mg/dl

< 1 mo : Cefotaxime +- Aminoglycoside

CSF Gram stain
: Gram Positive Cocci in pair
Latex agglutination
: not done
Culture : pending

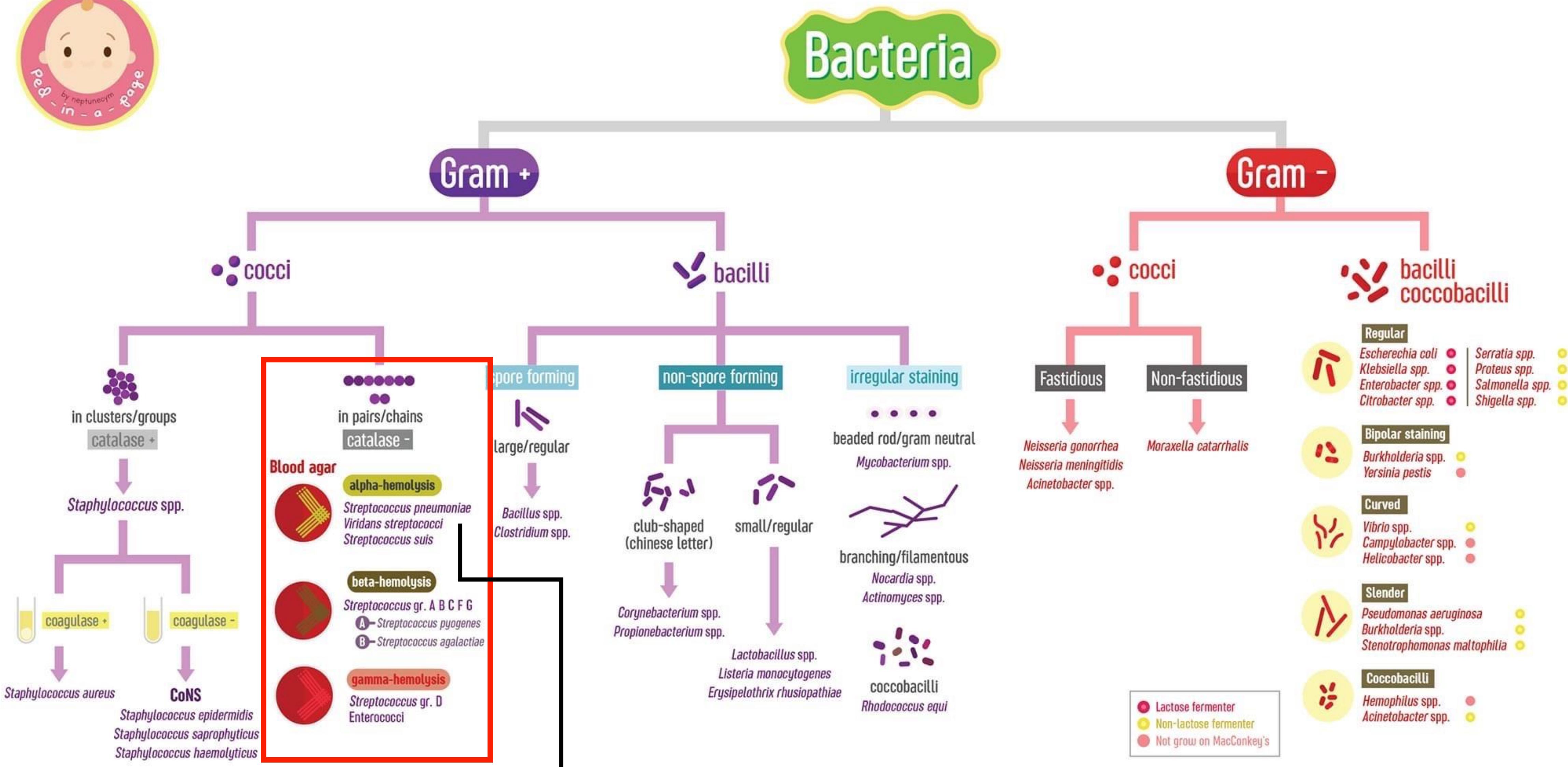


**Empirical ATB
For bacterial
meningitis**

Table 202.3 Values of Cerebrospinal Fluid (CSF) Studies in Neonates and Infants by Age	
CSF WHITE BLOOD CELL COUNTS	CELLS/mm³
Upper limit of normal by age*	
1-28 days	18
29-60 days	8.5
61-90 days	8.5
90th percentile by age [†]	
0-7 days	26
8-28 days	8-9
29-56 days	6-8
95th percentile by age [‡]	
0-28 days	19
29-56 days	9
CSF Protein	
Upper limit of normal by age*	
1-28 days	131
29-60 days	105.5
61-90 days	71
90th percentile by age [†]	
0-7 days	153
8-28 days	84-106
29-56 days	84-105
95th percentile by age [§]	
0-14 days	132
15-28 days	100
29-42 days	89
43-56 days	83
CSF Glucose	
Lower limit of normal by age*	
1-28 days	30
29-60 days	30.5
61-90 days	33.5
10th percentile for infants 0-56 days [†]	38-43

Nelson 21st Edition, Avery's Diseases of the Newborn 10th Edition,
Gomella's Neonatology 8th Edition

What are the appropriated ATB for this patient ?



Indicate Pulse in Red

Date	21 ก.ค. 66	22 ก.ค. 66	23 ก.ค. 66	24 ก.ค. 66	25 ก.ค. 66	26 ก.ค. 66	27 ก.ค. 66	
Days after	Admission	1	2	3	4	5	6	7
Pulse	C 2 6 10 14 18 22	2 6 10 14 18 22						

H/C CSF C/S UC

LP

Cefotaxime 220 mg ic q 6 hr(210 MKDay) + Amikacin 65 mg iv q 24 hr (15 MKDay)

Respiration ครั้ง/นาที			52	52	46	48	48	52	50	54	54	52	52	50	52	52	54	52	50	50	48	50	34	46	48	40	40	44	42	48	46	40	42	48	48	34	36	36	32	34							
Systolic(mmHg)			101	98	97	104	77	87	93	84	90	80	100	101	91	88	90	107	77	79	71	95	77																								
Diastolic(mmHg)			56	63	55	75	66	44	46	36	51	68	57	65	56	58	60	75	39	45	59	50	42																								
Wt.(kgs)			4.210										4.170											4.100											4.150				4.252								
Diet			NPO										NPO											IF/NPO											BM				un				un				
SOS Score																																															
SPO2 RA													99	100	100	100	100	98	100																		97	100	100	99	99	99	99	98			
SPO2 O2													100	100	100	100	100	97	97																		100	97	99		100	100	100	98			

Respiration គ្រឿង/នាហី		52	52	46	48	48	52	50	54	54	52	52	50	52	52	54	52	50	50	50	48	50	34	46	48	40	40	44	42	48	40	42	48	34	36	36	32	34
Systolic(mmHg)		101	98	97	104	77	87	93	84	90	80	100	101	91	88	90	107	77	79	71	95	77																
Diastolic(mmHg)		56	63	55	75	66	44	46	36	51	68	57	65	56	58	60	75	39	45	59	50	42																
Wt.(kgs)		4.210				4.170				4.100				4.150				4.252																				
Diet		NPO				NPO				IF/NPO				BH				nn				nn				nn												

CSF Culture and H/C result

SPECIMEN: Blood (Peripheral Line)

* Aerobic Culture *

10 hrs

Gram Stain: Gram Positive Cocci (Pair) (22-10-2023 10:03/PL)

CULTURE: 1. Strep. agalactiae(cMLSB Resistant Strain)

iMLSb/cMLSb : inducible/constitutive Macrolide, Lincosamide, type B Streptogramin

1.MIC SIR 1.MIC SIR 1.MIC SIR

PENICILLIN... S

AMPICILLIN... S

CEFOTAXIME... <=0.5 S

CEFTRIAXONE.. S

CEFEPIME.... <=0.5 S

CHLORAMPHENIC <=2 S

ERYTHROMYCYN. >4 R

SPECIMEN: CSF (Cerebrospinal Fluid)

* Aerobic Culture *

1. Moderate Strep. agalactiae(cMLSb Resistant Strain)

iMLSb/cMLSb : inducible/constitutive Macrolide, Lincosamide, type B Streptogramin

1.MIC SIR 1.MIC SIR 1.MIC SIR

PENICILLIN... S

AMPICILLIN... S

CEFOTAXIME... <=0.5 S

CEFTRIAXONE.. S

CEFEPIME.... <=0.5 S

CHLORAMPHENIC <=2 S

ERYTHROMYCIN. 4 R

Diagnosis : Strep. Agalactiae meningitis and septicemia

Late onset disease (LOD) ; 7-89 days of age , commonly manifests as bacteremia (93%) and meningitis (30%)

20% have neurodevelopmental impairment , 50% of LOD afflict term neonates

Horizontal acquisition from mother's milk (25%), other site: pneumonia, bone and joint infection, cellulitis

Complications : neurodevelopment impairment, hearing loss, persistent seizure, cerebrovascular disease

Date

21 ก.ค. 66		22 ก.ค. 66		23 ก.ค. 66		24 ก.ค. 66		25 ก.ค. 66		26 ก.ค. 66		27 ก.ค. 66	
Days after	Admission	1	2	3	4	5	6	7					
	Operation												
Pulse	C	2 6 10 14 18 22	2 6 10 14 18 22	2 6 10 14 18 22	2 6 10 14 18 22	2 6 10 14 18 22	2 6 10 14 18 22	2 6 10 14 18 22					
Indicate Pulse in Red													

Indicate Pulse in Red

Antibiotic Therapy:

Cefotaxime 220 mg ic q 6 hr (210 MKDay) + Amikacin 65 mg iv q 24 hr (15 MKDay)

Findings:

- Day 1:** H/C CSF C/S UC CRP : 108 (Yellow Box)
- Day 3:** H/C : GBS CSF C/S : GBS (Cyan Box)
- Day 6:** LP* (Yellow Box)
- Day 6:** H/C : NG CSF C/S : NG (Cyan Box)
- Day 7:** H/C : NG (Cyan Box)

Step to Cefotaxime 300 MKDay

Respiration ครั้ง/นาที			52	52	46	48	48	52	50	54	54	52	52	50	52	52	54	52	50	50	48	50	34	46	48	40	40	44	42	48	46	40	42	48	48	34	36	36	32	34		
Systolic(mmHg)			101	98	97	104	77	87	93	84	90	80	100	101	91	88	90	107	77	79	71	95	77																			
Diastolic(mmHg)			56	63	55	75	66	44	46	36	51	68	57	65	56	58	60	75	39	45	59	50	42																			
Wt.(kgs)			4.210										4.170											4.100											4.150				4.252			
Diet			NPO										NPO											IF/NPO											BM			un		un		un
SOS Score																																										
SPO2 RA													99	100	100	100	98	100														97	100	100	99	99	99	99	98			
SPO2 O2			100	100	100	100	100	100	97	97									100	100	100	100	98	99	100	97	99		100	100	100	98										

Respiration គ្រឹែ/នាហី		52	52	46	48	48	52	50	54	54	52	52	50	52	52	54	52	50	50	48	50	34	46	48	40	40	44	42	48	46	40	42	48	34	36	36	32	34
Systolic(mmHg)		101	98	97	104	77	87	93	84	90	80	100	101	91	88	90	107	77	79	71	95	77																
Diastolic(mmHg)		56	63	55	75	66	44	46	36	51	68	57	65	56	58	60	75	39	45	59	50	42																
Wt.(kgs)		4.210				4.170				4.100				4.150				4.252																				
Diet		NPO				NPO				IF/NPO				BM				nm				nm				nm												

CSF analysis pattern

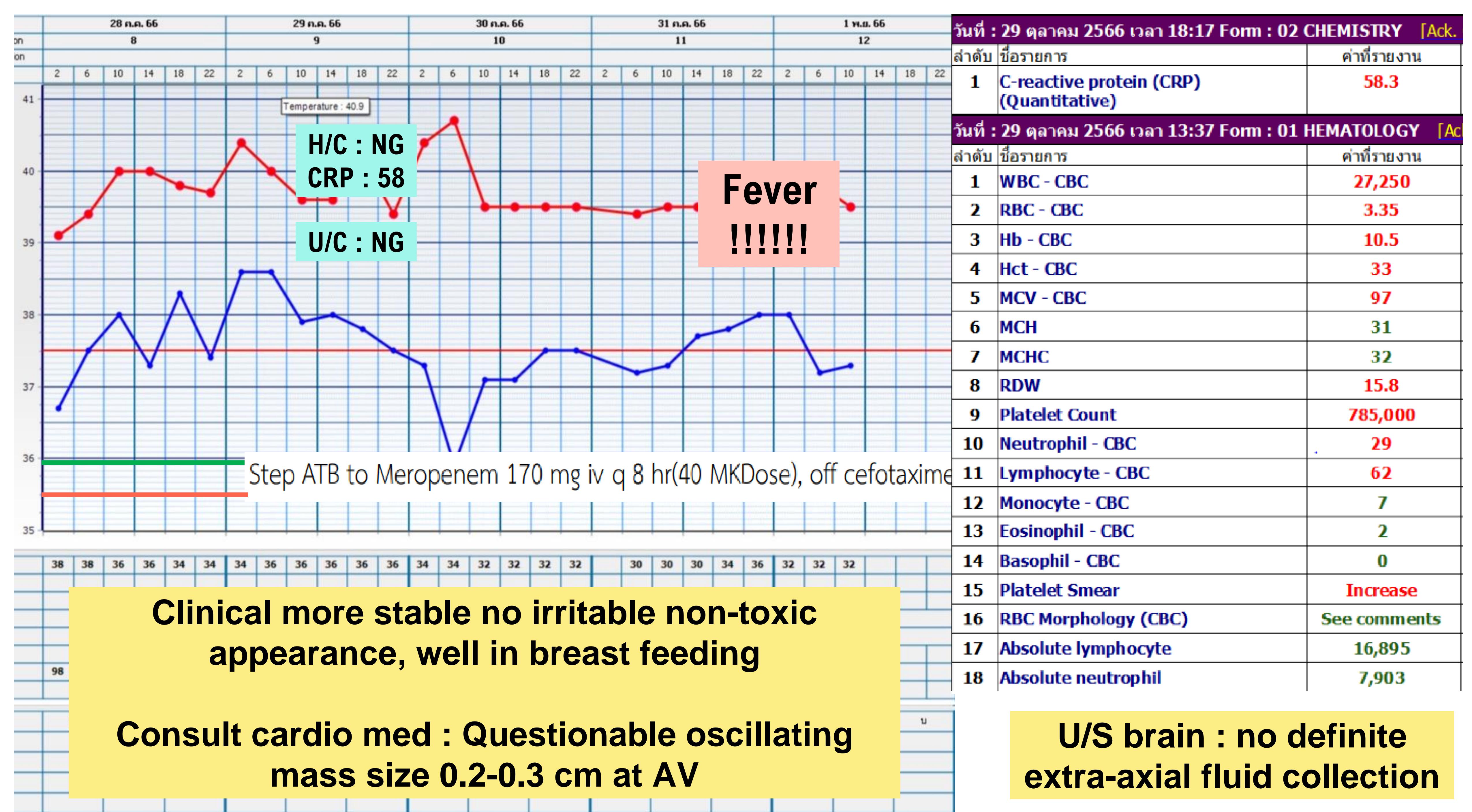
21/10/66

Post Cefotaxime 300 MKDay

26/10/66

Appearance	Clear
RBC	330 /ul
WBC	440 /ul
Neutrophils	81%
Lymphocytes	19%
India ink	Neg
Glucose	11 mg/dl / DTX 88
Protein	367 mg/dl
C/S	GBS

Appearance	Clear
RBC	170 /ul
WBC	160 /ul
Neutrophils	42%
Lymphocytes	58%
India ink	Neg
Glucose	26 mg/dl / DTX 87
Protein	285 mg/dl
C/S	No growth



What would you do
if you're a general pediatrician
consultant ?

pertinent finding & problem list

Pertinent finding

Positive findings

GBS meningitis and septicemia

Partial treatment of GBS by cefotaxime

Subacute fever not response to ATB treatment

Infantile age of onset , Breast feeding

Leukocytosis with thrombocytosis

Severe infection (septicemia and meningitis)
and late onset of GBS disease

Questionable oscillating mass size 0.2-0.3 cm at AV

Negative findings

No sign of increase ICP / CN involvement

No history of seizure

Clinical improve, patient look well

Term newborn with no risk of vertical infection

Clinical non-toxic appearance after treatment

No specific history of male siblings' death

Problem list

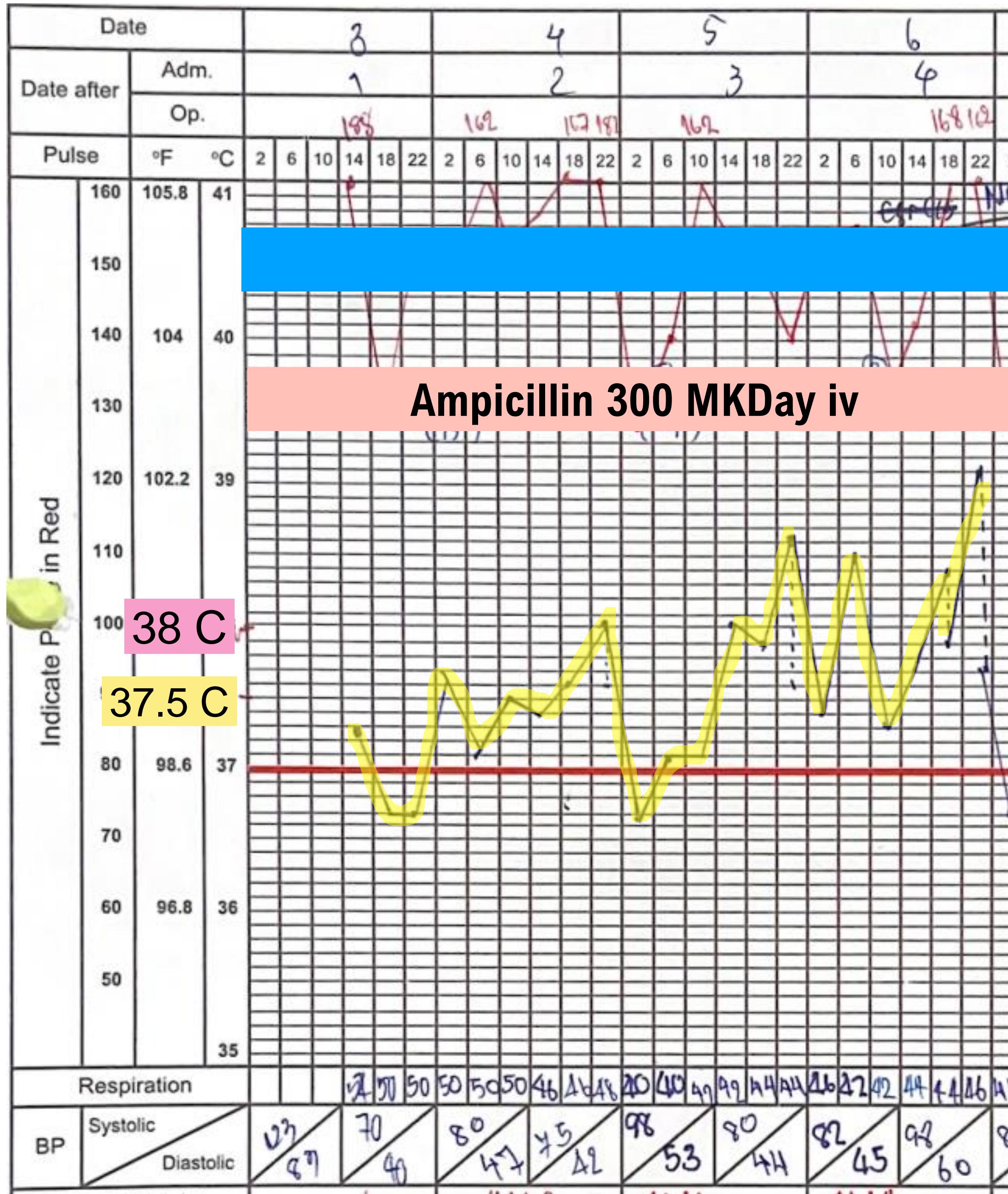
**An 1 month 8 days old male presented with subacute fever with history of late-onset GBS disease;
GBS meningitis and septicemia
status post antibiotics treatment for 2 weeks**

Refer to PMK hospital

At PMK hospital

- **GA : Active, no dyspnea, no cyanosis**
- **BW 4,778 gm, Lt 54 cm, HC 38 cm**
- **V/S : BT 37.3 C, PR 90 /min, RR 50 /min, BP 90/47 mmHg, SpO₂ 100% RA**
- **Skin : no mottled skin, no rash, no petechiae, no ecchymoses**
- **HEENT : anterior fontanelle 2x2 cm, no bulging, posterior fontanelle fingertip, not pale, anicteric, no eye discharge, no injected conjunctiva, no dry lips, no sunken eyeballs**
- **Neck : no cervical lymphadenopathy**
- **Skin : no Janeway lesion, no Osler nodes**

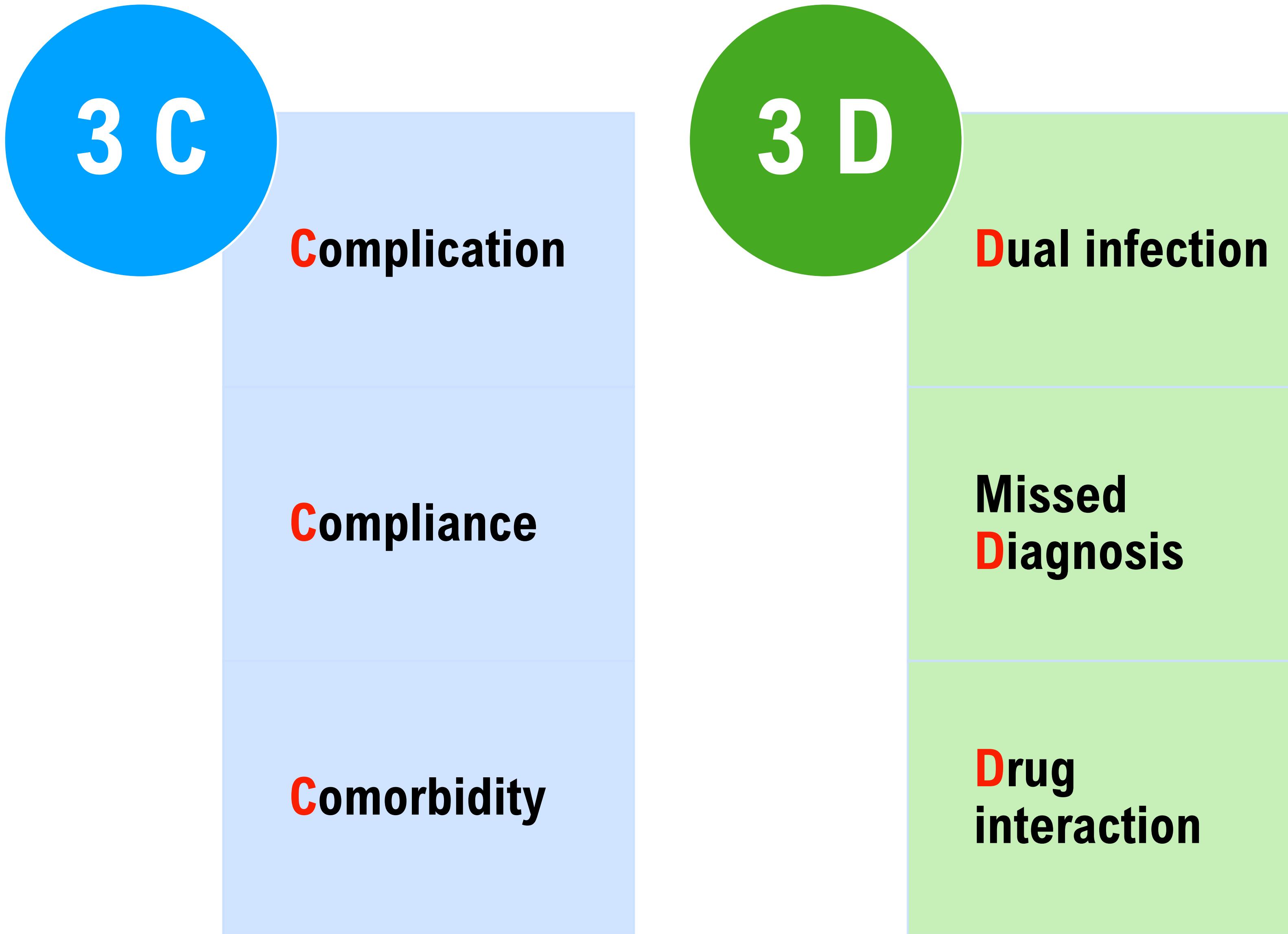
- **CVS : full pulse, capillary refill<2 sec, normal S1S2, systolic ejection murmur grade II at LUPSB no thrill**
- **RS : no nasal flaring, no retractions, clear equal breath sounds both lungs**
- **Abd : soft, no guarding, no hepatosplenomegaly**
- **Genitalia : normal male type, descended both testes**
- **Ext : no edema, full ROM, no swollen joints, no sacral dimple, no deformities**
- **Neuro : equal bilateral movements, normal tone Brudzinski's sign negative ,Kernig's sign negative, no facial palsy, pupil 3 mm RTLBE., sensory- cannot evaluated, Moro reflex+ve, Grasping reflex+ve, DTR2+all**



Approach to This patient condition

An 1 month 8 days old male presented with subacute fever with history of late-onset GBS disease; GBS meningitis and septicemia status post antibiotics treatment for 2 weeks

Approach to patient in persistent disease



Differential to this patient problems

3 C

Complication

Compliance

Comorbid

Complications	Pros	Cons
Subdural empyema	<ul style="list-style-type: none">Post GBS meningitis with subacute feverInfant period (40%)	<ul style="list-style-type: none">No sign inc. ICPNo AF bulgingNo rapid increase HC
Ventriculitis with hydrocephalus	<ul style="list-style-type: none">Post GBS meningitis with subacute feverHigh grade intermittent feverAssociated from	<ul style="list-style-type: none">No sign inc. ICPPapilledemaCN VI palsyNo bulging AFNo irritable / look sick
Brain abscess	<ul style="list-style-type: none">Post GBS meningitis with subacute feverNot fully response ATB	<ul style="list-style-type: none">No focal neuro deficitNo look sickNo headache (limitation)No rapid increase HC

Differential to this patient problems

3 C

Complication

Compliance

Comorbid

Complications	Pros	Cons
Endocarditis From late onset GBS disease	<ul style="list-style-type: none">Post GBS septicemiaInfantile periodR/O oscillating mass at AV	<ul style="list-style-type: none">SEM at LUPB not common locationNo other criteriaNegative hemocultureBeta-hemolytic strep : uncommon
Septic arthritis Osteomyelitis from GBS	<ul style="list-style-type: none">GBS septicemiaHigh level of inflammatory markerReactive thrombocytosis	<ul style="list-style-type: none">No clinical of joint swelling or limited in movement

Differential to this patient problems

3 C

Complication

Compliance
Of treatment

Comorbid

Compliance	Pros	Cons
Non proper ATB Mx	<ul style="list-style-type: none">• Cefotaxime can treat plus ampicillin• In late-onset GBS disease in infant 8-28 days of age, if meningitis suspected, ampicillin plus cefotaxime should be used	<ul style="list-style-type: none">• Proper dose of cefotaxime and switch to proper dose of ampicillin total 14 days
Hx treat cefotaxime with amikacin Then switch to Meropenem		

FROM RED BOOK 2021

Differential to this patient problems

3 D

Dual infection

Missed Diagnosis

Drug interaction

Missed diagnosis	Pros	Cons
Fever of unknown origin cause		
1. Infection	<ul style="list-style-type: none">As complication table	
2. Miscellaneous		
<ul style="list-style-type: none">Drug fever	<ul style="list-style-type: none">History used of cephalosporin and carbapenem ATB for 2 weeksClinical status of patient look well / non-toxic appearance	<ul style="list-style-type: none">Intermittent high grade of fever when try to off the ATB
<ul style="list-style-type: none">Thrombophlebitis	<ul style="list-style-type: none">Prolong ATB drip via peripheral line	<ul style="list-style-type: none">No sign of inflammation at site
3. Collagen vascular	<ul style="list-style-type: none">None	<ul style="list-style-type: none">None
4. Malignancy		

Investigation in this patient

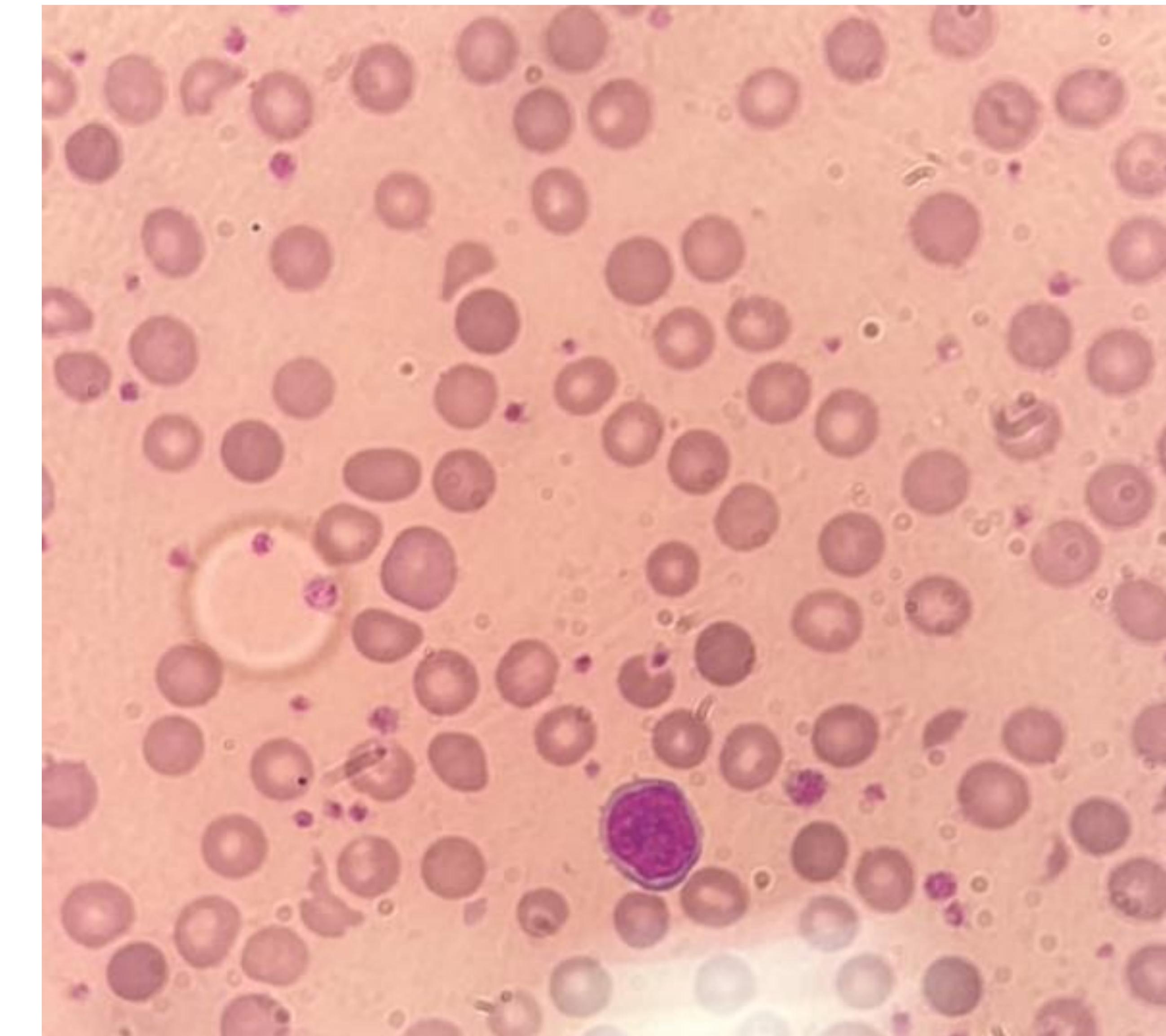
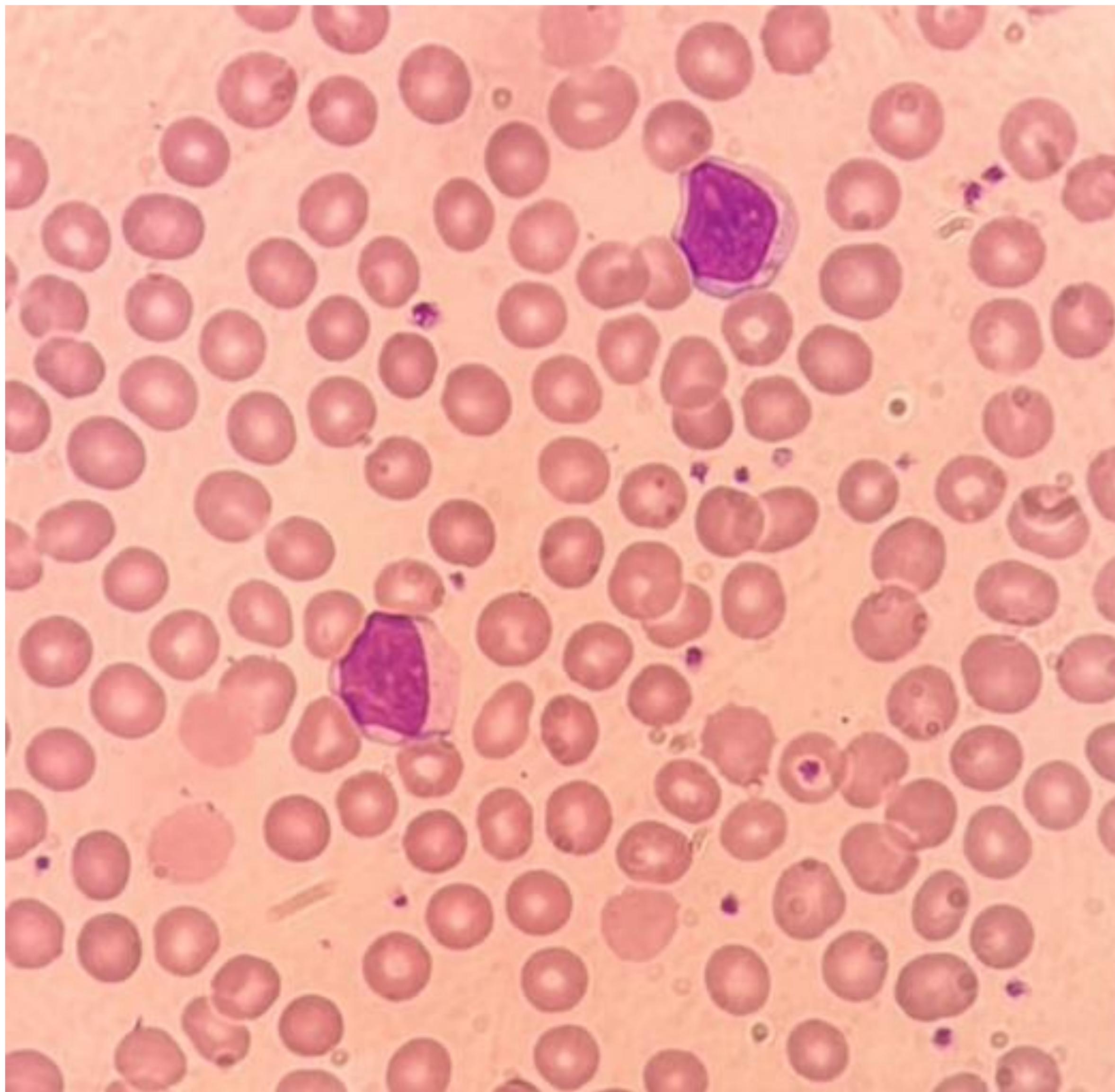
Hematological

	3/11/66	5/11/66
Hb	9.7	8.5
Hct	28.7	25.3
WBC	24300	22100
Neutrophil	38	50.5
Lymphocyte	24	40.3
Monocyte	8	8.2
Eosinophil	0	0.7
Basophil	2	0.3
Platelet	1119000	966000
PT/INR	13.5/1.2	G6PD : 330

	3/11/66	5/11/66
MCV	90.3	89.4
MCH	30.5	30
MCHC	33.8	33.6
RDW	18.1	18.4
ANC	9234	11160
ALC	5832	8800
DCT		Neg
Reticulocyte		5 (2.6)
LDH		150

	มารดา	บิดา
Hb	12.8	13.2
Hct	38	40
MCV	90	85
MCH	30.2	28
MCHC	33.6	33.3
RDW	12.7	13.9
OF	Neg	Neg
DCIP	Neg	Neg
Platelet	226,000	179,000
Hb typing	A2A A2 2.9%	A2A A2 2.6%

Peripheral blood smear



Hematological problem

Table 2 Conditions associated with thrombocytosis (platelet count $>800 \times 10^9/l$) in 139 patients*

	No (%) of patients
Infection	53 (38)
Surgery/trauma/tissue damage	29 (21)
Malignant disease/chemotherapy	16 (12)
Connective tissue disorders	13 (9)
Respiratory distress	11 (8)
Iron deficiency	8 (6)
Metabolic disorders	6 (4)
No obvious cause	3 (2)

*Data from present study, Addiego *et al.*,¹ and Chan *et al.*,² See text for further description.

Table 3 Infections associated with platelet counts $>800 \times 10^9/l$ in 53 patients*

	No of patients
Respiratory:	
Pneumonia	9
Bronchiolitis	3
Tonsillitis	1
Croup	3
Gastrointestinal:	
Viral enteritis	4
Bacterial enteritis	1
Peritonitis (postoperative)	7
Appendicitis (postoperative)	2
Hepatitis	1
Neurological:	
Bacterial meningitis	8
Meningoencephalitis	3
Infected cerebrospinal fluid shunt	1
Others:	
Urinary tract	3
Viral fever	2
Septic arthritis	2
Osteomyelitis	1
Soft tissue abscess	1
Pericarditis	1

*Data from present study, Addiego *et al.*,¹ and Chan *et al.*,²

Secondary thrombocytosis

A J Vora, J S Lilleyman

> Pediatr Infect Dis J. 1992 Jun;11(6):456-60. doi: 10.1097/00006454-199206000-00007.

Thrombocytosis and thrombocytopenia in childhood bacterial meningitis

T Kilpi ¹, M Anttila, M J Kallio, H Peltola

Subdural effusion and cephalosporin therapy were associated with more pronounced thrombocytosis.

The difference between the thrombocyte curves of the surviving and dying patients might be utilized in predicting the final outcome in the severest cases of bacterial meningitis.

We speculate that inflammatory cytokines, especially interleukin 1-beta, induce reactive thrombocytosis in bacterial meningitis.

Microcytic anemia With high RDW In this patient

- Blood loss
 - Iatrogenic : blood test
 - GI bleeding from stress induced >> occult blood

- Thalassemia : less
 - Hb H
 - Thal-1 deletion
- Enzyme defect : normal
- Hemolysis : normal

Blood chemistry

	6/11/66	9/11/66
BUN	2.5	4.1
Cr	0.15	0.16
Na	140	141
K	3.73	5.2
Cl	104	100
HCo3	25	22
Anion gap	11	19

	6/11/66	9/11/66
Total pro	-	6.87
Alb	3.58	4.07
TB	-	0.27
DB	-	0.14
AST	-	24
ALT	-	13
ALP	-	208

Urine analysis

	3/11/66	5/11/66
Urine sp.gr.	1.002	1.002
pH	7	7.5
Nitrite	Neg.	Neg
Protein	Neg	Neg
Glucose	Neg	Neg
Ketone	Neg	Neg
WBC	0-1	0-1
RBC	0-1	0-1
Epi	0-1	0-1
U/C	NG	

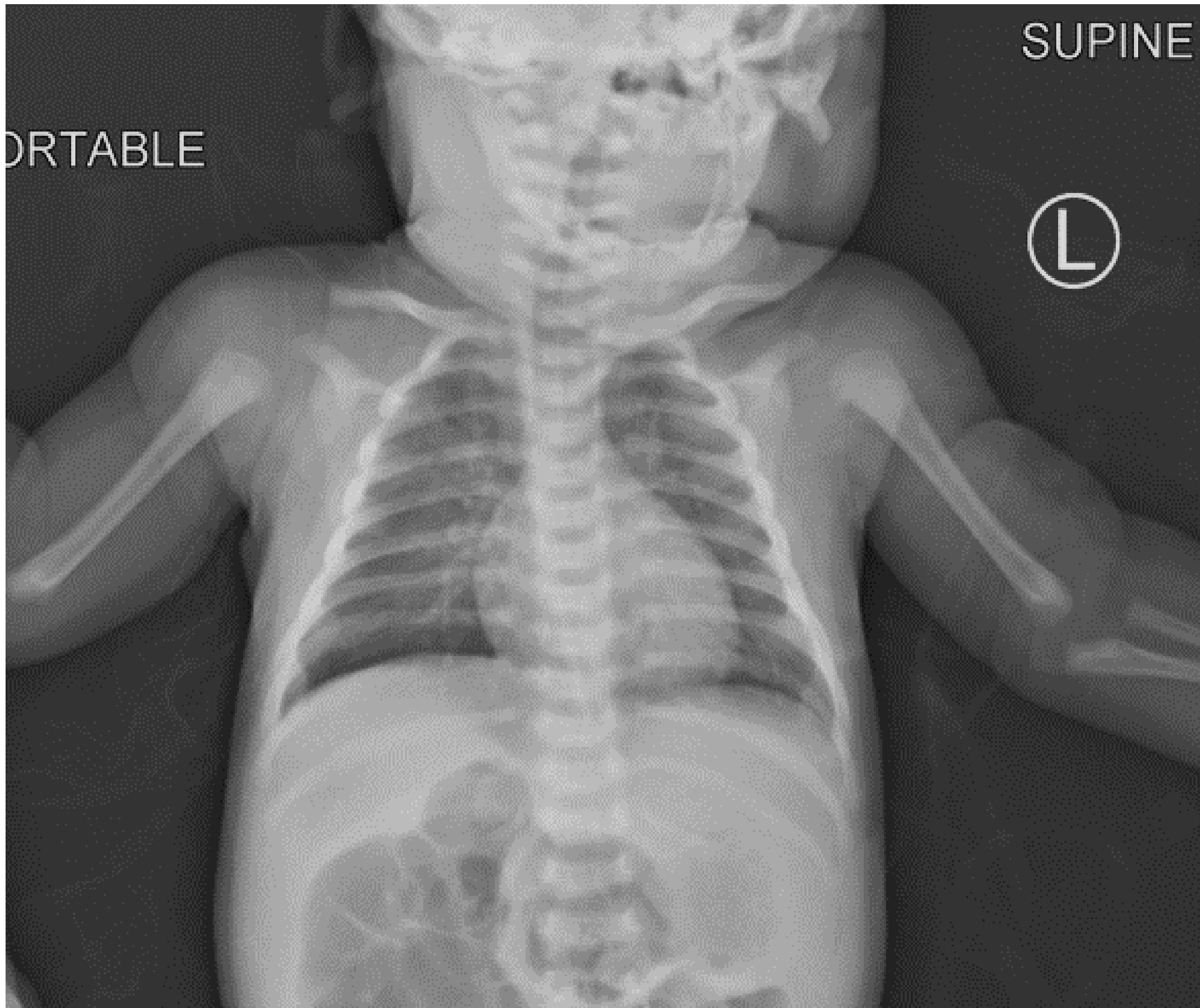
Inflammatory marker

	6/11/66	
CRP	24.5 (ampicillin)	
Procalcitonin	0.15	

Culture

	3/11/66	6/11/66
H/C	NG	NG
CSF C/S	-	NG

CXR



Echocardiogram

Intact atrium and ventricular septum

Mild TR, mild PR

Confluent PA branches

LPA stenosis; Peak PA pressure 22 mmHg

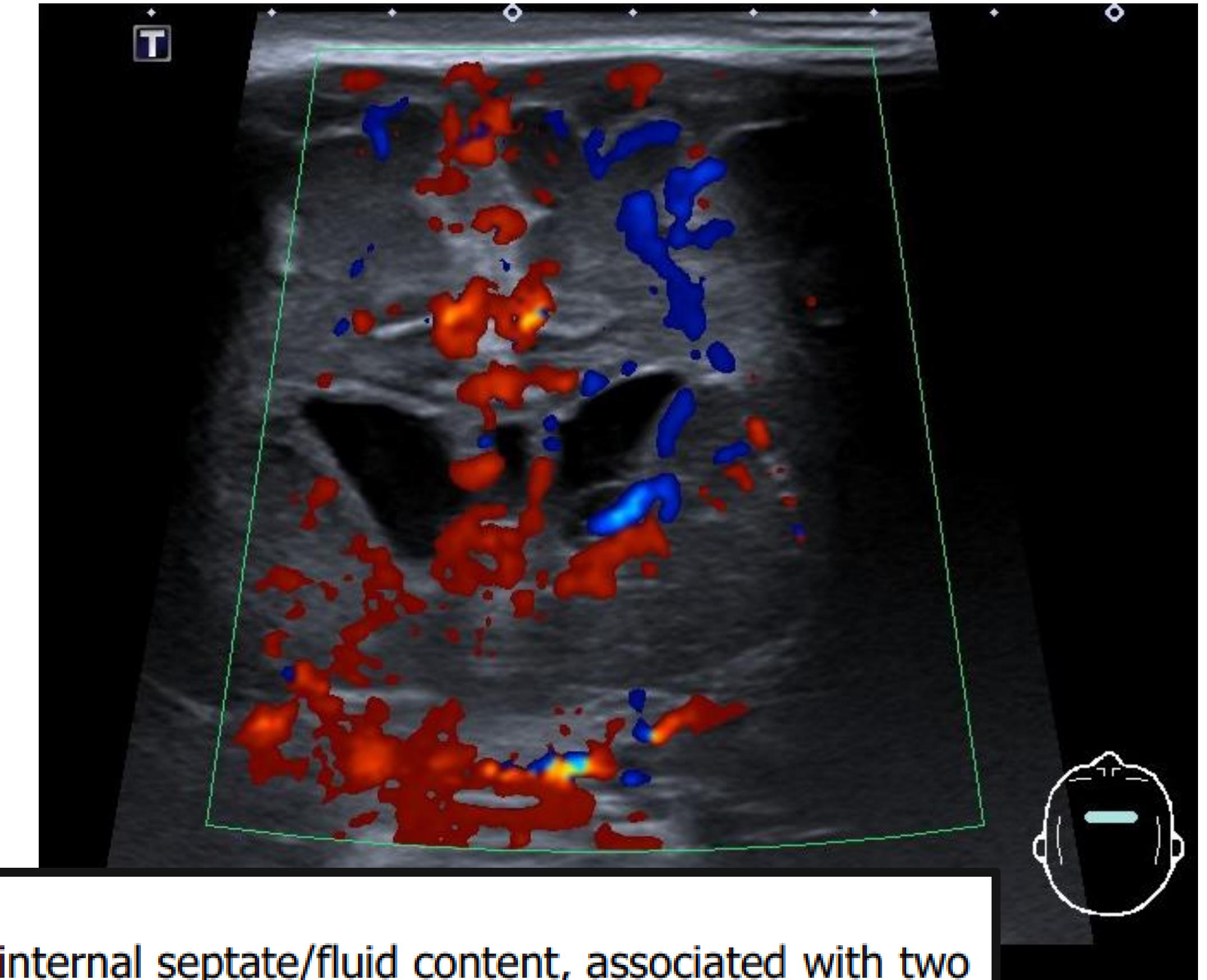
No MR, no AR

No IOA, No PDA

No evident of intracardiac mass

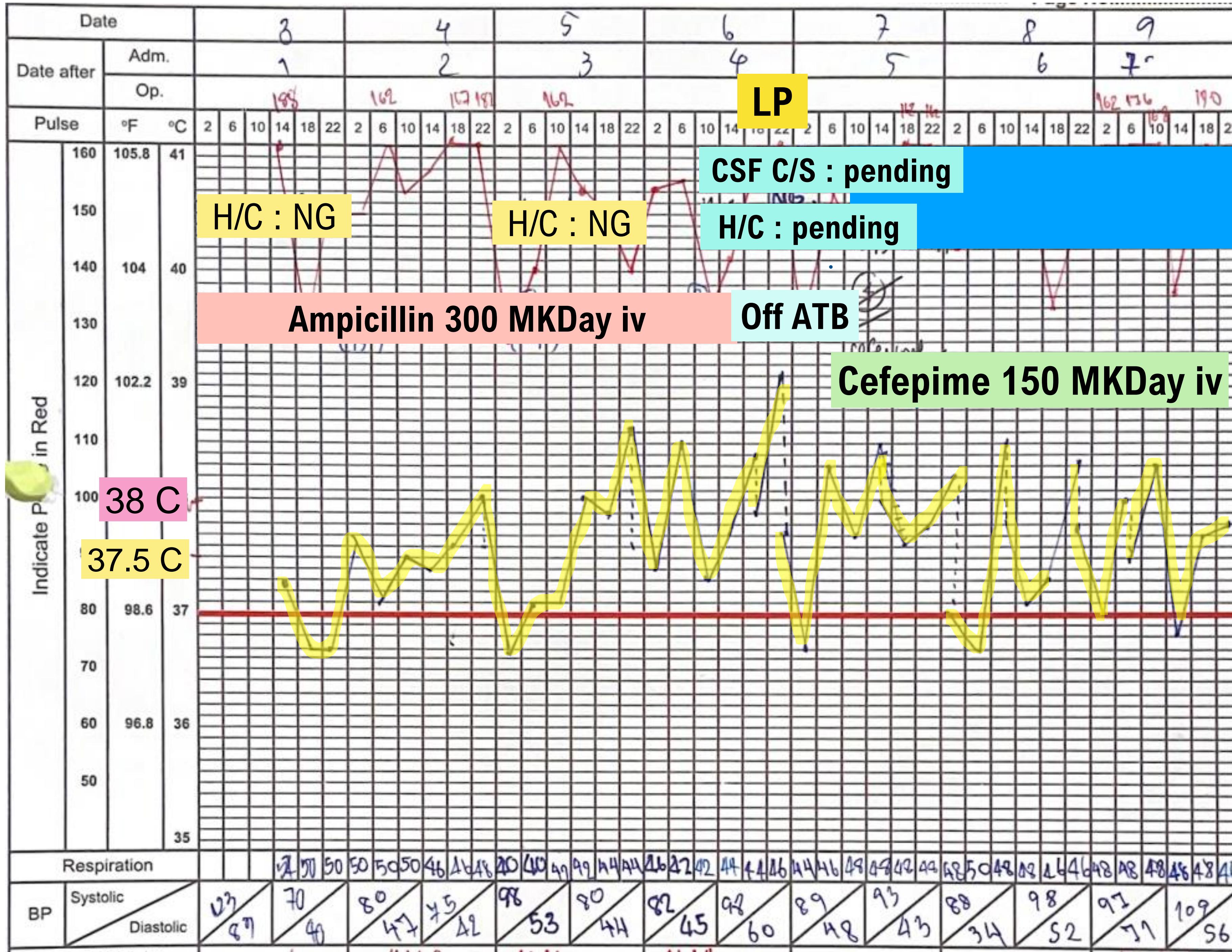
Imp : No evidence of infective endocarditis

US brain



IMPRESSION:

- Prominent size of bilateral lateral ventricles with internal septate/fluid content, associated with two hypoechoic lesions at bilateral periventricular regions and increased vascularity of adjacent brain parenchyma, **could be infection/inflammation such as ventriculitis. Further MRI brain is helpful.**
- No definite evidence of intra/extraxial abscess.



Further step investigation and management

Urine analysis

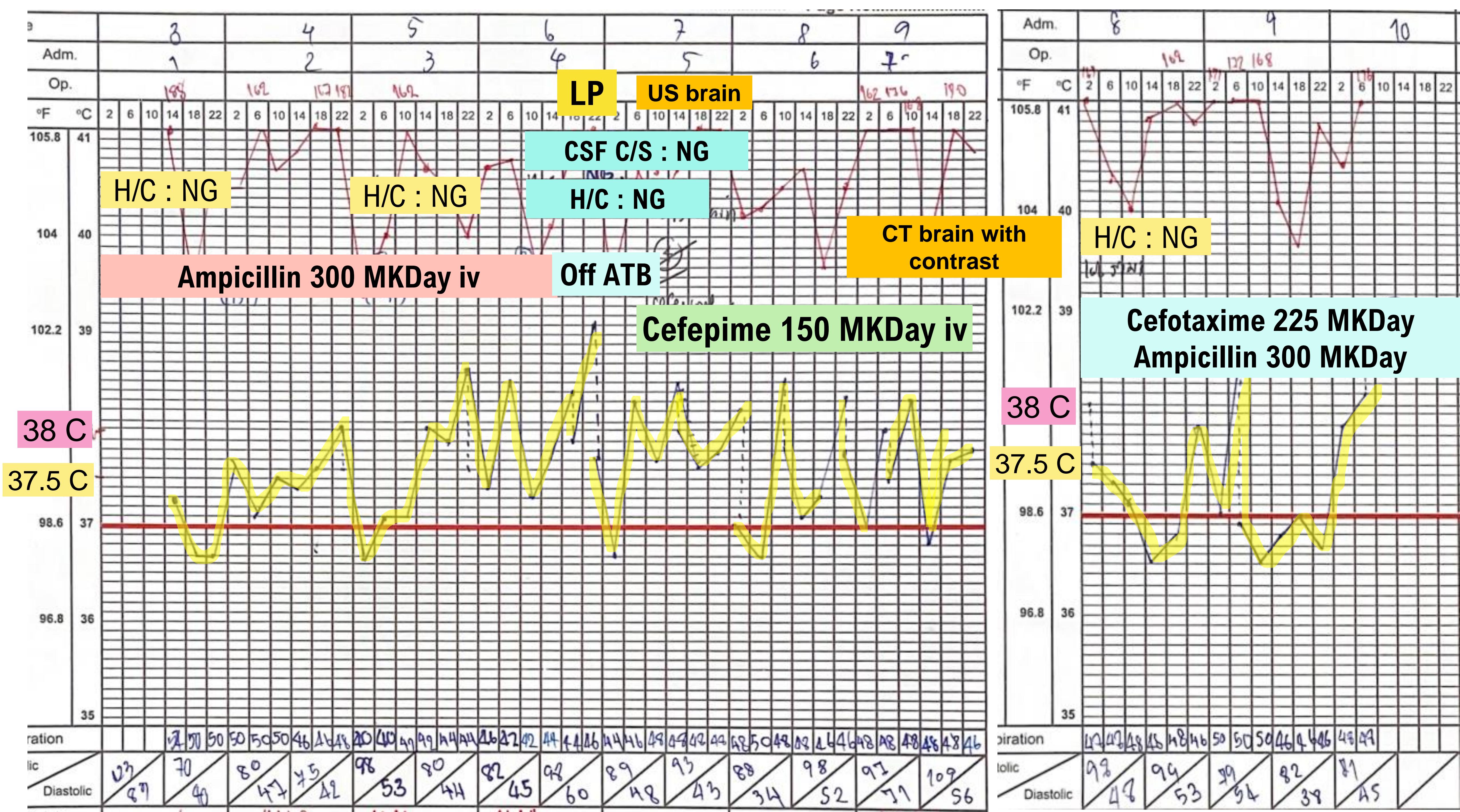
	3/11/66	5/11/66
Urine sp.gr.	1.002	1.002
pH	7	7.5
Nitrite	Neg.	Neg
Protein	Neg	Neg
Glucose	Neg	Neg
Ketone	Neg	Neg
WBC	0-1	0-1
RBC	0-1	0-1
Epi	0-1	0-1
U/C	NG	

Inflammatory marker

	6/11/66	9/11/66
CRP	24.5 (ampicillin)	91 (off ampi)
Procalcitonin	0.15	

Culture

	3/11/66	6/11/66
H/C	NG	NG
CSF C/S	-	NG

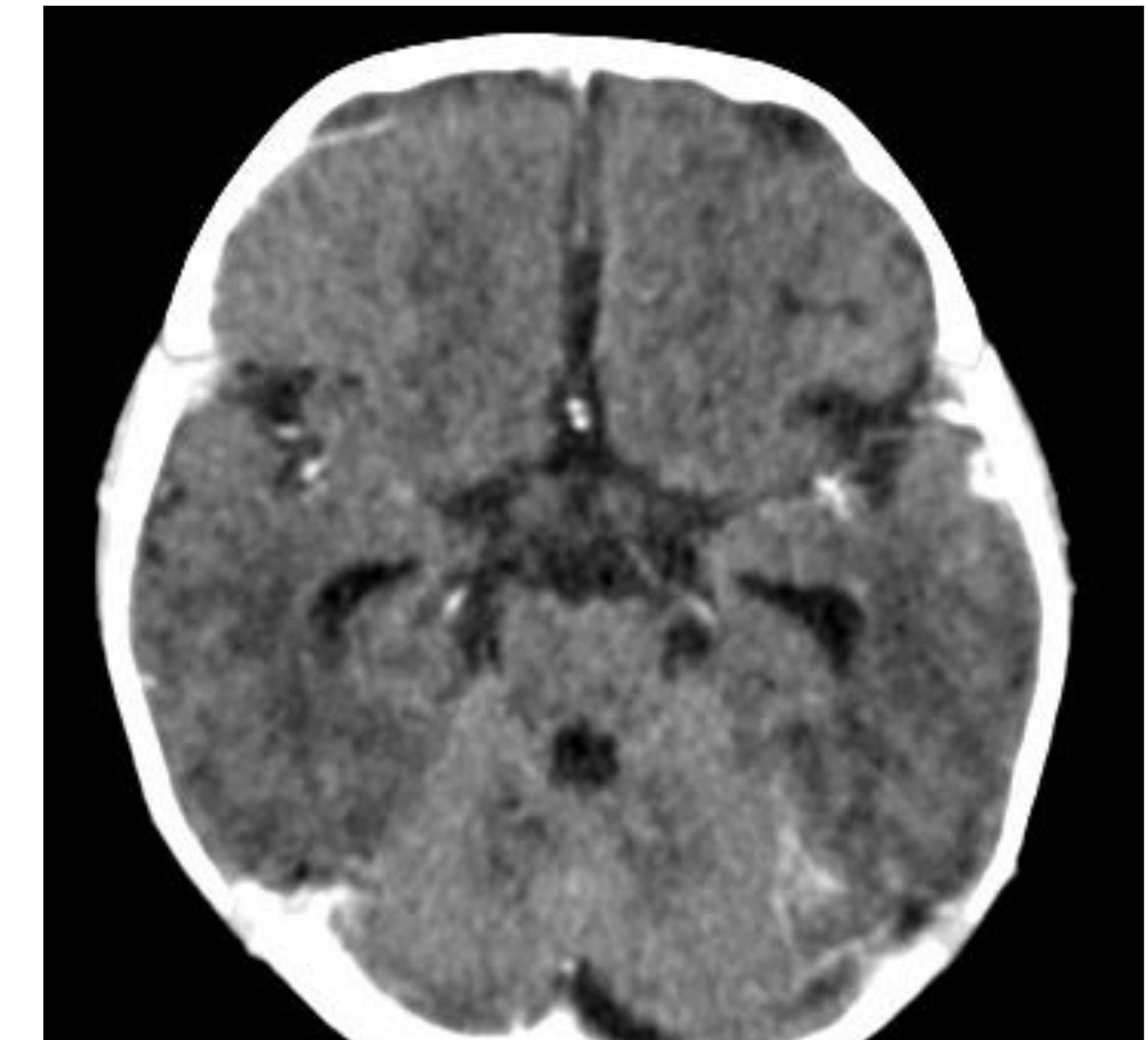


CT brain with contrast



**Hypodensity with rim enhancing lesion size < 2 cm in diameter at right frontal lobe area
: suspected cerebritis; early abscess**

CT brain with contrast



Mild diffuse dilatation of all ventricles and basal cistern : Hydrocephalus

Definite diagnosis

Acute cerebritis at right frontal lobe from post GBS meningitis

Management

Cerebritis / small solitary abscesses (< 2 cm in diameter) can be treated by antimicrobials alone

In this patient use of ...

- Cefotaxime 225 mg/kg/day IV
- Ampicillin 300 mg/kg/day IV

Duration of treatment for 4-6 weeks then follow up neuro imaging

No studies to guide the prophylactic use of antiepileptic therapy

Follow up sequelae : Epilepsy, new motor deficit, persistent visual field cuts, learning disorders, hearing impairment, hydrocephalus

Approach more in this patient

3 C

Complication

Compliance

Comorbid

Severe

- Septicemia
- Meningitis

Unusual

Inborn error of immunity

Conventional

Non-conventional

Management of Infants at Risk for Group B Streptococcal Disease

Karen M. Puopolo, MD, PhD, FAAP^{a,b}; Ruth Lynfield, MD, FAAP^a; James J. Cummings, MD, MS, FAAP^d; COMMITTEE ON FETUS AND NEWBORN, COMMITTEE ON INFECTIOUS DISEASES

Late-Onset GBS Disease GBS late-onset disease (LOD) is defined as isolation of GBS from a normally sterile site from 7 to 89 days of age.

Rarely, primarily among infants born very preterm or infants with immunodeficiency syndromes

Approach from 4 O in IEI

3 C

Complication

Compliance

Comorbid

		Pros	Cons
	T cell defect	<ul style="list-style-type: none">• Onset : Early onset• Not seen normal thymus	<ul style="list-style-type: none">• Organism• Organism• Normal ALC
	B cell defect	<ul style="list-style-type: none">• Organism : Encapsulated bacteria; Streptococci• IgG subclass deficiency	<ul style="list-style-type: none">• Onset• Normal ANC• Normal tonsils
	Complement	<ul style="list-style-type: none">• Onset : Any age• Organism : invasive GBS (C2,C4 deficiency)• Organs : meningitis	
	Non-conventional	<ul style="list-style-type: none">• IRAK4 and MYD88 deficiency• TLR , IL1	

Laboratory tests in immunodeficiency

Type	Number	Reference
IgG	542	(311-549) mg/ml
IgA	8	(8-34) mg/ml
IgM	59	(19-41) mg/ml
CD3	3900	(2500-5500) cells/uL
CD4	2700	(1600-4000) cells/uL
CD8	1100	(560-1700) cells/uL
CD19	700	(300-2000) cells/uL
CD56	1600	(170-1100) cells/uL

Type	Number
C3	Normal
C4	Normal
CH50 activities	Normal

**Non-conventional
defects in innate
immunity
Can't be rule out**

Thank you for
your attention

