

Pediatrics

= Neonatology

by "Dr. SINGARHAI"

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Perinatal mortality Ratio (PMR)

$$= \frac{\text{No. of Perinatal death}}{1000 \text{ live Birth.}}$$

Neonatal mortality Rate (NMR)

→ numerator part of
Denominator

$$\frac{\text{no. of death of babies < 28 day}}{1000 \text{ live Birth}}$$

live BIRTH :-

- irrespective of Gestational age after the Baby born shows sign of life -
Breathing, HR(+), umbilical cord
pulsation, definitive muscle movements

Remarkable features ⇒

TERM

Pre-term

- lots of skin
creased on sole

→ No creases

→ thin. fine HMR

less lanugo

→ Abundant lanugo

Thick ear cartilage

→ Thin

Descended testis

→ scrotum empty

Rugae Seen on

→ Rugae less &

testis Abundantly

Absent

Breast Buds

> 5mm

< 5mm

♀ genitalia = Labia majora /
minora

Labia majora /
minora prominent

ANTENATAL DIAGNOSIS :-

① Ultrasound - TIFA (Targeted Imaging for fetal anomalies) **

usually done b/w 18-20 wk.

- earliest anomaly detected on usg

↓
Neural tube defect (NTD) = 14-16 wks

(Anencephaly)

↳ seen/detected 10-12 wks

• can also detect = Trisomies
(clue)

↓
as "Soft Sign"

↳ suggestive of
underline patho. condn.

are -

• choroid plexus cyst

• Golf Ball Sign

(echogenic focus in ventricles)

*** Increase in nuchal thickness &
translucency (trisomy 21 &

* Hydrops fetalis *

- echogenic Bowel wall (cystic fibrosis)
- single umbilical artery (renal malformation)

"SOFT SIGNS" can also seen in (N) Babies
But if many sign sent it may
suggestive of trisomy.

(2) chorionic villous sampling :-

never do ^{oo} 10-12 wk gestation
(≤ 9 wks as it may cause fetal limb defects) - needle Aspirate of trophoblast cells
- Δ - Trisomies

(3) Amniocentesis =

done $\rightarrow$ > 14 wk of gestation
- Δ - Trisomies

(4) PUBS / (Percutaneous umbilical Blood sampling) / CORDOCENTESIS $\rightarrow \geq 20$ wks
can Be used for Diagnostic & Therapeutic purpose

(5) Cell free fetal DNA (cff DNA) testing.
 $\rightarrow$ use maternal serum

'useful' in Δ of -

$\rightarrow$ single gene disorders
& Trisomies.

ROUTINE NEWBORN CARE :-

Care at BIRTH :-

A → Aseptic Precaution (5 'cleans')

① Clean Hands

② " Surface

③ " Blade

④ " umbilical

cord clamp

⑤ Clean umbilical

* Dry cord

B Prevent HYPOTHERMIA ⇒

→ delivery Room temp^s = 25°C

→ Receive Baby in warm cloth

C Delayed cord clamping →

→ Delayed upto 60 sec

→ done to prevent Anemia in later childhood

D cleaning the Baby

→ white material of over = VERNIX CASEOUS
Baby (preterm)

→ Absorb on its own

E Bathing ⇒ postponed after fall of umbilical cord.

F wt. Recording = after 24 hrs. (Delayed till Baby stable)

- (a). Initiation of Breast feeding.
- As soon as after Birth or at least 2 in 1 hr.

- (H). Vit-K administration :-

Dose = 1 mg 10m Vit.K

of Baby < 1 Kg = 0.5 mg

→ prevents Hemorrhagic ds. of Newborn.

Warm chain



10 steps



Prevent Hypothermia.

Normal Newborn phenomenon ⇒

cause of Parenteral CONCERN ⇒

SKIN changes ⇒

- Mongolian spots ⇒ seen on sacral region
- common in Asian population ⇒ greenish black/slate like macules
⇒ d/t arrest of migration of melanocytes.

- MILIA/MILLIARIA :- white spots over the Nasal Bridge Region. d/t Blockage of sebaceous gland.
→ Redness & white SPOTS.

- ⑥ Epstein pearls ⇒ white, ^{-purplish} lesion seen over palate / tip of the penis

- ⑥ Salmon patch ⇒ (Nevus SIMPLEX) :-
- cutaneous haemangioma over head & neck
- Symmetrical
- aka STORK BITES

- ⑥ Erythema toxicum ⇒ most common skin Rash condition seen in Newborn.

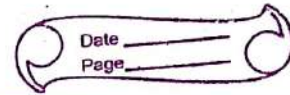
→ MISNOMER

→ erythematous - papular lesions seen over face, chest or all over Body.

But (N).
⇒ Eosinophil Laden sterile lesions seen = (N)

- ⑥ Postulac Melanosis ⇒ Brown pigment aka transient pustular melanosis.
Neutrophils seen in its lesion

- ⑥ Harlequin SKIN changes = Pretorsion
↳ (N) phenomenon
→ Pale & Red =
→ differential vascular tone



⑥ Subconjunctival Haemorrhage ⇒

① condⁿ Delivery compression

↓
Breakage of small conjunctival vessels.

TOC = Reassurance

⇒ confind by "Scleral Borders".

② Retinal Haemorrhage is also ② phenom.

Other ② FINDING :-

- Vaginal mucoid discharge/Blood
- Hymenal skin Tag
- Breast Engorgement

Female
at presence
of maternal
estrogen

= Natal teeth



② first Appears = 6 month.

→ Interfere with ② B. feeding.

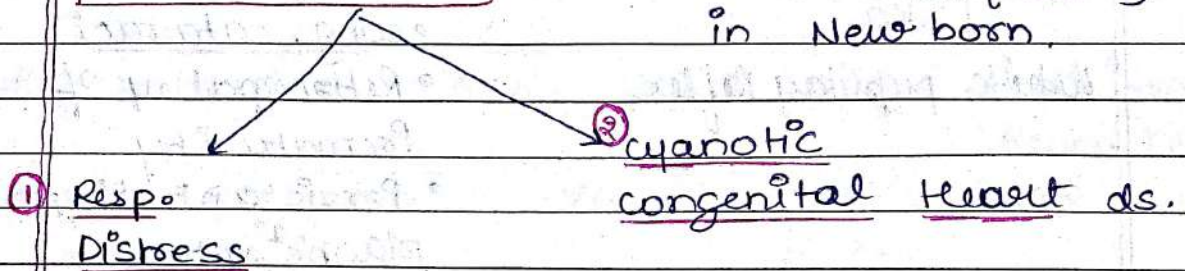
→ Risk for Aspiration

→ So, Natal teeth if seen it should be extracted.

Natal teeth is seen in $\Rightarrow$

- ① ELLIS VAN Crevald syndrome
- ② Pierre Robin SYNDROME

CENTRAL CYANOSIS = Not a (N) finding in New born.



Peripheral cyanosis = Acrocyanosis = (N)
Murmurs on Birth

$\rightarrow$ "most common - SYSTOLIC MURMUR"

$\Downarrow$
(N) d/t closure of Ductus arteriosus

- $\rightarrow$ meconium = Greenish = first stool (24 hrs)
- $\rightarrow$ Golden Yellow stool = On 1 week = Normal

On 1st week to 10 days = Baby start losing wt upto 10% of weight till 10th day.
and after 10 days it start gaining wt.

37-10
300

why?

Q Bank

① Bupthalmos. = seen in congenital glaucoma
⇒ it occurs d/t sclera & cornea
is elastic in early days &
d/t Tse GUP - leads to
Ox eye.

② Leukokoria ⇒ ~~seen~~ seen in ⇒
↓ aka
"white pupillary Reflex"
• cong. cataract
• Retinopathy of Prematurity
• Persistent Hyperplastic^{1°} Vitreous
• Retinoblastoma.

BABY - FRIENDLY HOSPITAL INITIATIVE

(BFHI) ⇒ global effort to promote
Breast feeding, on
Demand.

IUGR

cause

Baby

maternal

drugs -

• Steroids

• β -Blocker

• Phenytoin

Placenta

⇒ Includes AbN SUA & FGR (fetal growth Restriction)

⇒ Asymmetric v/s Symmetric IUGR

$P.I = < 2$

> 2

Head ①

Rest = small

maternal / paternal

(Head $\gg \gg$ CC)

Baby - small
(trisomies)

Causes :-

- maternal
- Placenta
 - P. Previa
 - Ab. Placental
 - twin placenta

→ fetal → chromosome Abnormality.

① → loss of subcutaneous fat.

② → wasting of m/s

③ → doose skin Folds * *

characteristics.

Mix of Suspected IUGR →

① Repeated USG measurements

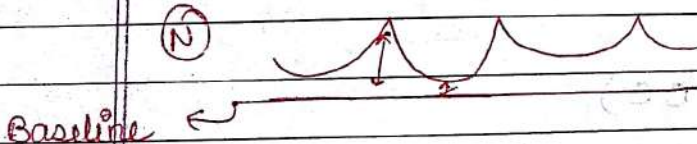
- ✓ oligohydram.
- ✓ head circumference
- ✓ Abdominal "

② Doppler Blood flow studies :-

↓
Pulsed wave doppler
usually done in umbilical artery

↓
• Diastolic Blood flow

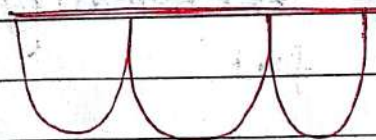
↓
will less blood flow in IUGR.



↓ Diastolic
B. flow



Reverse
Diastolic
flow



→ High Risk of IUD.
→ delivery should be done.

① Amniotic fluid Index

→ $[AFI < 5]$ = sugg. oligohydros.

② Cardiotocograph Assessment

IUGR = maternal
↓
Alcohol Smoking CRF

Imp. DIABETES → overt Diabetes ⇒ develop IUGR.

→ Gestational Diabetes ⇒ MACROSOMIA
(BIG BABY)
LGA

⇒ IUGR Babies ⇒ don't have hepatomegaly

⇒ In IUGR - Asymmetric Babies

↓
✗ Brain Not affected.

TEMPERATURE REGULATION

Q// SHIVERING = generate heat & work
in Adult But not
in Baby.

Why prone HYPOTHERMIA :-

① • Large surface Area



Head = largest Body S.A &
max^m heat loss from head

② ↓ thermal insulatⁿ d/t lack of
sub cut. fat

③ Reduced amount of Brown fat
(Adipose
tissue)

↓
SGA / Preterm Baby (↓↓)

Brown fat = present only in
Neonates.

Concentrated in ⇒ Nape of Neck
⇒ Interscapular reg.
⇒ around kidney & Ad.
⇒ Axilla

Histologically = fat = Brown colour
(d/t abundant
amount of
mitochondria)

⇒ Non-shivering thermogenesis

Q// Cold stress = $36 - 36.4^{\circ}\text{C}$
 • mild Hypo. = $32 - 35.9^{\circ}\text{C}$
 • severe " = $< 32^{\circ}\text{C}$

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CONSEQUENCES ? OF HYPOTHERMIA on Baby.

- lethargic
- Hypoglycaemia
- Sepsis

Normal New born temp^r = $36.5 - 37.5^{\circ}\text{C}$

(Hypoth. < 36.5)

Q// Preferred way of measuring temp in New born Baby ??

⇒ AXILLARY Temp^r = Preferred. (For 3 min.)

Rectal temp^r = should be avoided (to avoid injury)

"Rectal temp^r" = Duration = "2 min"

New Born = loses heat

- mechan
- ① conductn
 - ② Evaporatn = "sweating"
 - ③ Convection = "Air currents"
 - ④ Radiation

↳ most imp. source of heat loss in Baby due to involvement of head who got large

S.A

mnemonic - We Went In Summers But
Brothers & AND mothers provide
Water.

WARM CHAIN

- 10 steps.

- (a) WARM delivery = 25°C
- (b) Warm Resuscitation = Radiant warmer
- (c) Immediate Drying.
- (d) SKIN to SKIN contact & mother
- (e) ~~Wash~~ Breast feeding
- (f) Bathing Postponed (untill cord fall off (5-7 days))
- (g) Appropriate clothing
→ "SWADDLING" = Not be done as baby chest movements affected.
- (h) Mother & Baby together = Rooming in
- (i) professional awareness & Training
- (j) Warm transportation.
→ "Transport Incubator"
→ temp. of vehicle should maintain.

HYPERTHERMIA :-

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① Temp $> 37.5^{\circ}\text{C}$.

→ fluctuating temperature - suggestive of "SEPSIS" (serious)

Baby - found - hyperthermia

↓
"Dehydration" (mc cause of hyperthermia)

Mx :- first line tx of choice.

⇒ ↑se Breastline feeds.

BABY - HEAT Productn.

① Cutaneous Vasoconstriction

① Universal flexion like a fetus

① Breakdown ^{Brown} fat & adrenaline secretion. (Non-shivering thermo.)

NOTE :- Baby does not generate heat through shivering.

⇒ crying = Breathing,

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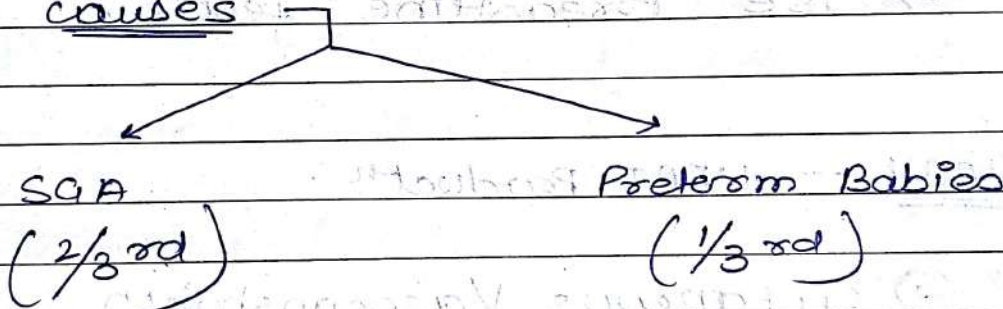
Fetus born in 6th month not able to SURVIVE due to ⇒
Absence or insufficient amount of SURfactant

mature SURfactant ≥ 35 wks.

Management OF LBW BABIES ⇒

Around = 30% LBW

causes



Etiology = Prematurity ⇒

- Previous H/O Preterm Baby (mc)
- teenage / multiple preg.
- Acute systemic ds.
(chorioamnitis)

IDENTIFICATION OF CAUSE :-

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Prematurity $\Rightarrow$ < 36 wks + 6 days.
 $\Rightarrow$ Breast Nodule < 5 mm
 $\Rightarrow$ Genitalia
 $\Rightarrow$ Sole crease = Minimum/No.
 $\Rightarrow$ Ear cartilage = Recoil

SGA = IUGR

- Loose SKIN Folds
- Lack of subcut. tissue
- Head size Bigger
 $=$ Asymmetric IUGR
 $=$.

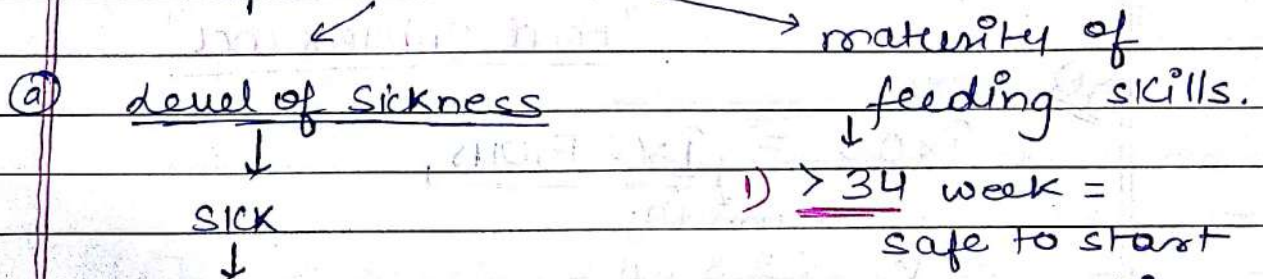
CLINICAL ISSUES o Prematurity & SGA.

See Khatri Notes.

micronium Aspr = mc in post-term Babies

Feeding of LBW INFANTS :-

Depend. 2 Factor



(a) Level of Sickness

↓
SICK
↓

Parenteral
(I.V. Fluids)

Fluid of $\Rightarrow$ 10% dextrose
 choice
 (First 2 day)

1) > 34 week =
safe to start
B. feeding

2) 32-34 wk = Spoon
feeding (Katori) or

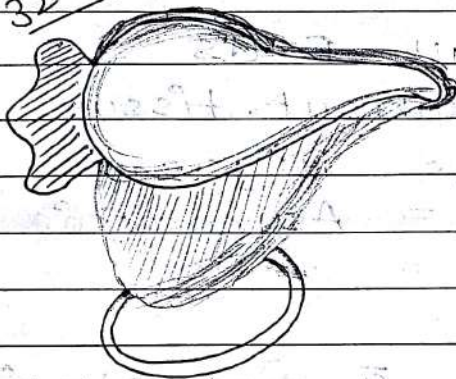
★ Paladai feeding
 (Exp. Breast milk)

c) < 32 week 1
Nasogastric feeding (EBW)
aka GAVAGE (Date FEB 14)

Parenteral I.V. FLUID ⇒

First 2- Days Fluid of choice = 10% Dextrose
> 2 Days (F&OC) ⇒ Isolyte-P

32-34 wks



"PALADAI / GOKARNAM"
FEEDING

Breast milk = Best milk / fluid to
Be given to Baby

< 28 weeks ⇒ but Immaturity

↓
Breast Feed

↓
"Feed Intolerance"

So, F&OC = I.V. FLUID

2 condⁿ

⇒ ① < 28 wks

⇒ ② Any SICK Baby

LBW FORMULA :-

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→ CHOICE OF MILK = Breast milk & except < 28 ~~or~~ sick

→ How much to feed :- depend on stomach capacity which is App "9% of Body wt."

→ Nutritional Supplementn :-
Preterm

- calcium (120mg/kg/day)
- (2-3mg/kg/d) - Iron - after "6 wk" of age
- folic Acid (50ug/kg/day)
- ZINC (0.5mg/day)

⇒ All these nutrition given till 40 wks of corrected age except IRON given till 1 yr of age

⇒ Vit. D (400 IU/day) = given in all day Babies. till 1 year of age.

FEED INTOLERANCE :-

& Indicator = Persistent Vomiting
= NG tube $> 25\%$ previous feed.

GROWTH MONITORING = WHO Growth charts.

Mx of inadequate wt. gain ⇒

- cause - incorrect feeding -
- inadequate feed.
- Baby = Infection (sepsis)
- Improper Nutrition or No Nutrition.

① Proper counselling

② Additional Expressed Breast MILK - Preterm

③ Demonstration of feeding technique.

④ Milk fortification

↓
• Preterm

• HMF = Human milk fortifier

KANGAROO mother care :-

↓

- Keeping baby on mother's skin
- protect Hypothermia
- develop good Bond b/w mother & Baby.

KMC = Started in preterm < 32 wks

↳ ~~all~~ done only in Stable Baby

LGA

→ Baby wt. > 90th percentile

> 2 SD above mean

causes :-

• constitutional LGA (most common)

• Infant of Diabetic mothers (IInd mc)

★ • Beck with - Weidmann Syndrome

→ a/w - Hemihypertrophy

- macroglossia (large tongue)

- umbilical hernia

★ ★ ★ QD - Omphalocele

- ear lobe crease ★ ★

• Soto Syndrome (cerebral gigantism)

• Nesidioblastosis (β -cell hyperplasia)

↓
Hyperinsulinemia

↓
Big Baby (LGA)

Clinical issue :-

• Birth Injury

• Birth Asphyxia

• Hypoglycemia

• Propensity for Adult Obesity

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① MORO'S REFLEX :- Appear = AT BIRTH (28-32 WK)

Abduction $\xrightarrow{\text{Followed}}$ Adduction
Extension $\xrightarrow{\text{Followed}}$ Flexion

→ ~~✓~~ ✓ completed Moro Reflex
↳ seen only in Term babies

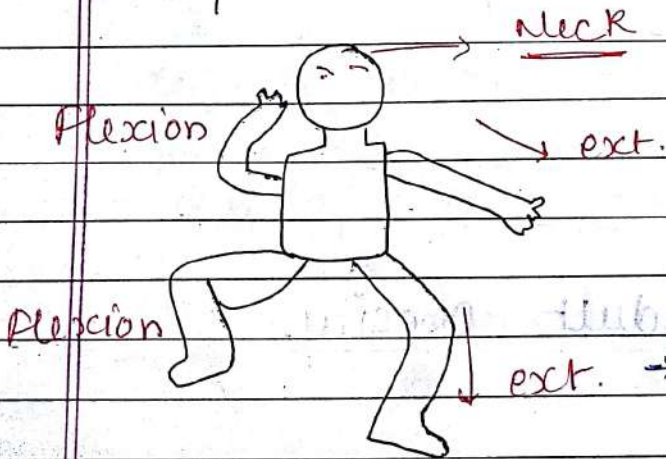
Incomplete mono. Reflex :-

↳ Only Abduction & Extension = sent

↳ ~~9~~ shown By Pre-term Baby.

⇒ Moro - Reflex persist / disappear at 6 month.

② Asymmetric Tonic Neck Reflex



⇒ sent at Birth

⇒ Disappear

↓
4-5 month - 7
(6-7 month)

FENCING Posture

If stuck = CNS disorders.

Reflex Isent at BIRTH :-

- (a) MORO'S
- (b) Asymmetric tonic Reflex
- (c) crossed extensor Reflex

Reflex Appearing after Birth :- (SPL)

- (a) Symmetric Tonic Reflex = ~~that~~ ~~that~~
- (b) Parachute Reflex
- (c) Dandau Reflex

PARACHUTE Reflex = ~~appear~~ persists throughout the life.
→ Appear = 7-8 month

U/L MORO'S Reflex :-

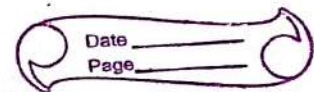
- (a) peripheral nerve "problem" ("Erb's palsy")
- (b) Bone = # (clavicle)

site = C5-C6

Rooting Reflex

→ onset = 32 w/c
→ Disapp. = 36 w/c

Palmar grasp = onset = 28
Dis p. = 32



MORO'S REFLEX

- sensitive to infant's alertness

(a) Absent = disturbance in CNS

- severe Hypoxic Ischaemic encephalopathy (~~not~~ Asphyxia)
- Kernicterus

(b) Asymmetric / - VL

- clavicle #
- orb's palsy
- Hemiparesis

(c) Brisk -

Neonatal Hypoglycaemia

(d) Exaggerated -

- Hydrocephaly
- Severe microcephaly vers.

★ Hypoxic Ischaemic encephalopathy

⇓
signs of BIRTH Asphyxia.

New BORN Baby

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Anemia :-

at Birth 16.5 - 18.5 g %

→ Hb < 15g %
→ Hb > 2SD below mean for Age

CAUSES

Blood loss ↑ RBC destructⁿ ↓ RBC prodⁿ

⇒ ↓ Hb
⇒ ↓ O₂ carrying
⇒ ↓ O₂ delivery

- ⊙ Lethargy
- ⊙ congestive cardiac Failure (severe Anemia)

(A) BLOOD loss (most common)

- obstetrical cause = "placental pathology"
- Twin-twin transfusion = monochorionic twins sharing of vascular connection

Donor - Anemia

Recipient - Polycythemia

- Int. Hemorrhage (Intracranial hemorrhage)
 - cephalohematoma
 - Subgaleal Hemorrhage

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seen
• Gastrogenic = Preterm baby
↓
Blood for sampling
↓
Predispose Anemia.

(B) ↑ RBC destruction →
• Jaundice
(Jaundice + Anemia)
↓

↓ Hemolysis

Intrinsic cause

- Hereditary Sphero. (AD)
- Hemoglobinopathies
- defect in RBC memb.

Extrinsic cause

- Sepsis (mc)
- Burns

(C) ↓ RBC production
• Anemia of prematurity
• constitutional Aplastic Anemia
↓

By Birth - B.m - affected

eg = Fanconi Anemia

Dyskeratosis congenita

EVALUATION :-

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① CBC with SMEAR, Reticulocyte counts

↓
help in Δ Hemolysis

② Direct coomb test (Antiglobulin test)

↓
 Δ of Autohemolysis $\Rightarrow$ a) Rh incompat.
 $\Rightarrow$ b) ABO incompat.

③ Bilirubin (total & Direct)

④ USG (Int. Bleeding) eg neuro USG - for I.C.H

⑤ Hb electrophoresis & RBC enzyme

↓
 Δ G6PD defⁿ

Pyruvate Kinase defⁿ

APT & DOWNEY Test :-

1ml of 1%
Sodium Hydroxide

HBA

clear

HbF -
resist

denaturation by
alkali (NaOH)

Swallowed mat.

1ml of 1%
NaOH

HbF

Blood

→ PPink

Baby Bleeding
(G.I Bleeding)

Physiological Anemia :-

High Hb at Birth



Drop in Hb

↓ till

8-10 WKS



then

Rise in Hb

contradicts

★

petechiae

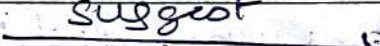


~~Jaundice~~ Hemolysis

★

Jaundice

suggest



Hemolysis

INTRAUTERINE INFECTION ** MICROCEPHAL **

POLYCYTHEMIA :-

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⇒ Hematocrit $> 65\%$ or Hb > 22.0 gm/dl
⇒ Hb $> 2SD$ above mean

× ⇒ There is Not seen in AGA babies.
⇒ there is No physiological polycythemia
⇒ Newer in Preterm Babies.
⇒ common in LGA & (SGA) Babies.
↓
compensate Intrauterine HYPOXIA.

Etiology :- Intra-uterine HYPOXIA
2° fetal transfusion

Dehydration should always Be Ruled out
↑ RBC lead → HYPERVISCOSITY.

CLINICAL ISSUE :- "HYPERVISCOSITY"

↓ Predispose
CNS = Hypotonia lethargic
Res = Respiratory distress syndrome
oliguria

Tx :- ① HYDRATION. haemo dilution → ↓ Hematocrit

↓ viscosity
② Partial exchange transfusion (PET)
↳ give saline → Hemodilution

$$\text{Volume (ml)} = \frac{\text{gnpt. Hct} - \text{Desired Hct} \times \text{wt (kg)}}{\text{gnl. Hct}} \times 90 \text{ ml/kg}$$

to calculate Saline
for PET

avg Blood
volume
in Baby

Flowchart

polycythemia

Adequate Hydration

polycythemia ++

Asymptomatic

Symptomatic (irrespective
of Hemato-
crit)

Hct < 70

70-75

> 75

PET

Hydration
observe

i.v Fluids
observe

LOCAL INFECTION :-

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① Omphalitis = Redness, swelling, pus in umbilical Region.

② CANDIASIS = "ORAL Thrush"

Rx = oral cotrimazole
Nystatin

③ Conjunctivitis ⇒ serious prob.
⇒ endangers vision in the child.

→ Day 1 conj. = chemical (silver Nitrate)

Day 2-5 = Gonococci

→ Day 5-14 = chlamydia trachomatis.

NEONATAL SEPSIS :- (Septicemia)

① 1st Ind m.c.c of Neonatal mortality

② ~~1st~~ m.c.c of neonate mor. = Perinatal mortality

Early onset
Sepsis

< 72 hrs

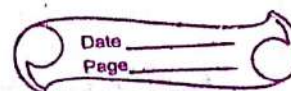
- Perinatal
- Present = Resp. distress, Pneumonia

m.c.

late Onset
Sepsis

> 72 hrs

- Hospi. Acq. Infectⁿ
- fulminant Blood & meningitis



"Any sick Babies has Sepsis until proven otherwise"

- Non specific clinical features.

INVES.

- BLOOD CULTURE = "GOLD STANDARD"

- Sepsis Screen

- ① Neutropenia - ↓ neutrophils
- ② ↑se in Immature: total neutrophil Ratio
- ③ ↑ESR/ CRP

⇒ most common cause of Orgo for Neonatal Sepsis

- ◆ INDIA = Klebsiella >> E. coli
- ◆ worldwide = Group B-streptococci

Tx ⇒

- Supportive Care
- Dehydration = I.V. fluid
- Seizure (meningitis) = Anti-epileptics

⇒ Definitive Tx = I.V. Antibiotics

⇒ Adjunctive Tx - maintain temp

↓ "Breastfeeding" - "Glucose Hydratn status"

- Preventive Strategies :- maintain good Hand Hygiene.

Lactoferrin Antimicrobial + Breastfeed
↓
protective against 'Ns.

DURATION OF ANTIBIOTIC THERAPY :-

- Meningitis = 21 days
- Blood culture (+ve) = 14 days
But no meningitis
- culture (-)ve = 5 days.
Sepsis

mc transmission of infectn ↓

Early Onset
(maternal)
(Perinatal)

NEONATAL HYPOGLYCAEMIA:

- most cases transient

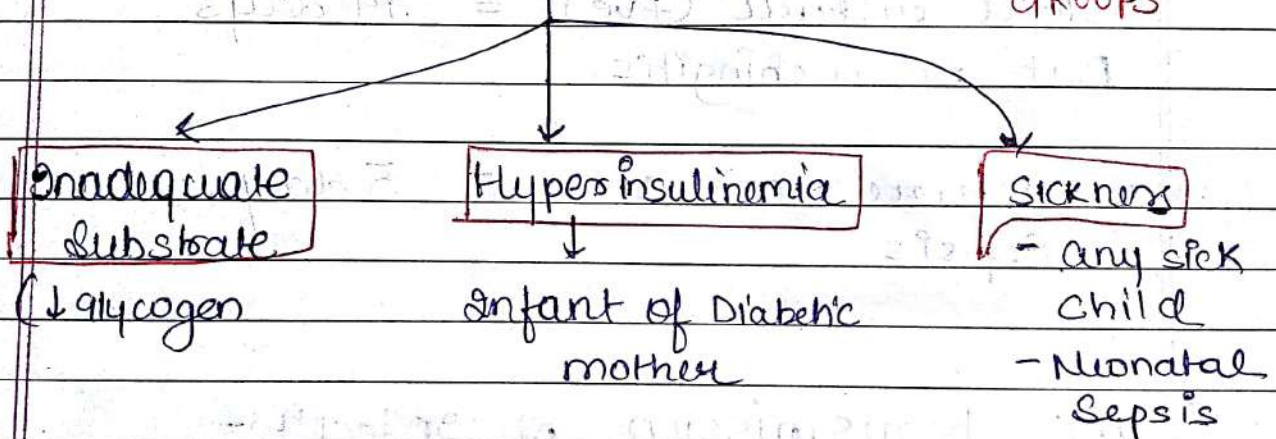
→ plasma glucose $< 45 \text{ mg/dl}$
→ venous sugar $< 40 \text{ mg/dl}$

Nelson = $< 55 \text{ mg/dl}$ (B.G)

- ⇒ Asymptomatic
- ⇒ neurodevelopmental delay
- ⇒ occipital lobe affected

cause vision problem

Screening is Recommended = HIGH RISK GROUPS



Screened at = BIRTH

1hr, 2hr 6hr hourly every

screening method of choice -

* glucose Reagent strips

enz. glu. oxidase

glu. dehydrogenase

Lab. $\Delta \Rightarrow$ Glucose oxidase = calorimetric
 $\Rightarrow$ Cuv. electrode method

Symptoms :- drowsy, tremors,
jitteriness, convulsion.

- ✓ - Neuroglycopenia
- ✓ - Autonomic disturbance
(sweating episodes)

Tx :-

Asymptomatic
(mostly)

1st line of Tx

• ORAL feeds ($>20\text{mg/dl}$) (20-40)

• $<20\text{mg/dl}$ = 9V Dextrose

Symptomatic
directly
start

I.V. dextrose

DOSE = BOLUS 2ml/kg of 10% Dextrose

followed by continuous
INFUSION.

Not exceed - glucose concn $>12.5\%$ on periph. line

① Extravasation ✓

② thrombophlebitis (severe)

$>12.5\%$ concn = put a central line

DRUGS FOR RESISTANT HYPOGLYCAEMIA

- Hydrocortisone
- Diazoxide
- Glucagon
- Octreotide

HYPOCALCAEMIA

→ Highly q/w Prematurity, (mc)

→ Total serum calcium $< 7 \text{ mg/dl}$ = Preterm
(ionized $\text{Ca}^{++} < 4 \text{ mg/dl}$)

Term = Total $< 8 \text{ mg/dl}$
(ionize $< 4.8 \text{ mg/dl}$)

Early Hypocalcaemia
($< 72 \text{ hrs}$)

cause -

- ① Prematurity
- ② Infant of DM d/t post natal rise of parathyroid hormone

delay

late Hypo
($> 72 \text{ hrs}$)

cause -

- Hypoparathyroidism
- vit. D defn
- Anticonvulsant therapy

Symptoms = neuromuscular irritability
↳ tremors, twitching
seizure

⇒ cardiac (irregular HR)

$$QTc = \frac{QT \text{ interval in seconds}}{\sqrt{R-R \text{ interval in seconds}}}$$

→ prolonged $QTc > 0.45$ = Feature of Hypocalc.

Tx

a) prophylactic = oral calcium
 ↳ - on prematurity
 → Birth Asphyxia] 1 week

b) Tx

"Asymptomatic"

"Symptomatic"

oral

DoV calcium

⇒ slow DoV. Infusion only
 (if given fast result Bradycardia)

PERINATAL ASPHYXIA

"Failure to initiate & sustain Breathing at BIRTH" = WHO

American Academy of Pediatrics CRITERIA :-

- ✓ Profound metabolic or mixed Acidemia
- ✓ Apgar score 0-3 for >5 min.
 - 0-3 - Severe ~~Hypoxia~~ Asphyxia
 - 4-7 - moderate Asphyxia
- ✓ ~~Neonatal~~ Neonatal neurologic sequelae (Developmental delay).
- ✓ Multorgan dysfunction
 - (↑ liver enzyme)
 - (↓ cardiac contractility)
 - Oliguria

Asphyxia



Hypoxia



Brain



Ischaemia

↓ cause

"Hypoxic Ischaemic encephalopathy"

symptoms -
term

- Seizures
- Altered sensorium
- Difficulty in clearing oral secret (Drooling of saliva)

⇒ **SEIZURE'S** = "HIGHLY SPECIFIC"
for HIE

→ Distal m/s >>> Prox. = affected

Date _____
Page _____

Neuropathology :- ~~Periventricular~~

Preterm

Term

→ Periventricular leukomalacia
(Spastic Diplegia)

→ IVH
(Intraventricular Hemorrhage)

→ cortical necrosis

selective

Diffuse
Neuronal
Necrosis
(Spastic Quadriplegia)

→ status Marmoratus

(Basal ganglia affected)

→ Extrapyramidal cerebral palsy.

a classification for HIE :-

① Levene classification

② SARNET & staging
(only name)

Preferred modality = Imaging

Term

→ Diffuse weighted MRI

Pre-term

⇒ USG (initial)

LEVENE CLASSIFICATION :-

		stage 1	2	Date _____ Page _____
		mild	mod.	severe
(A)	consciousness	irritability (Hyperirritability)	depression	Comatose
(B)	Hypotonia	mild	marked (Hypotonic)	Severe (flaccid)
(C)	seizures	nil	Present	marked
(D)	sucking / Respiration	Poor suck	unable to SUCK	Need asis. for Resp.
(E)	Reflex	Hyperactive	Hyperactive	Absent
(F)	EEG	(N)	Low voltage	Burst suppression

NEONATAL SEIZURES

* mc type of seizure in Neonate
↳ subtle seizure
(Related to Immaturity
of Nervous System)

* mc type of seizure in child / Adult
↳ GTCs

common cause

- ② HIE (mc)
- meningitis
- metabolic
 - Hypoglycaemia
 - Hypocalcaemia

⇒ Jitteriness mimics SEIZURES
 (Stimulus sensitivity) (eye Abn)
 (Cessation By Flexion) (Autonomic features)

Mx :-

 = a EEG (amplitude Electroencephalogram)
 (DOC) ↓
 Onushgathu done for neonatal seizures

maintain {
 • Temp
 • O₂
 • Perfusion — 10v. Fluid, ↑ contractibility Heart
 • Glucose
 • metabolic profile - hypocalcaemia - Tx
 • seizure ⇒ DOC = phenobarbitone

NEONATAL JAUNDICE

Date _____
Page _____

Around, 60% - term
80% - Preterm

2 wk of
Jaundice

↓
"Physiological
Jaundice"

UNCONJUG Bilirubin

"LIVER"

UDP-Glucosonyl
transferase

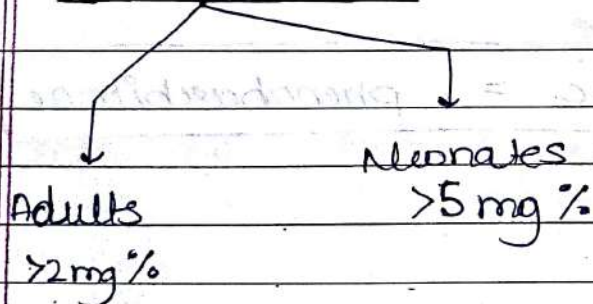
← Physiological
immaturity
of UDP-Glu.

↓
CONJUGATED

last for

- ① 1 week (term)
- ② 2 week (Preterm)

VISIBLE JAUNDICE :-



Jaundice = "Palm, Sole" = Pathological
Jaundice

$\Delta = \text{T.S.B}$

first day = 5mg/dl

2nd day = 10mg/dl

3rd day = 15mg/dl

High level UNCONJUGATED

BILIRUBIN



CROSS BBB



Basal ganglia



"KERNICTERUS"

Serious Jaundice = / Pathological

First

- visible jaundice = 24 hr of life

↳ d/t a) hemolysis (mc)

• Rh incompat.

• ABO incompat (mc)

b) intrauterine infectn

- Yellow palm & soles

- SIGN OF Kernicterus

• Irritable - Poor feeding

• High pitch "shrill cry"

• Seizures

• HYPERTONIA (Retrocollis)

→ Ophiotomous

(Arching of Back)

d/t spasm of para-vertebral m/s.)

Mix - severe Jaundice -

- (A) "PHOTO THERAPY"
(Bili to lamirubin) - structural isomerism
(Z to E isomers) - photo isomerism
- photo oxidatⁿ

most imp.
Pathway of
phototherapy

(B) Exchange Transfusion → 1st choice
medical Tx ⇒ "Splenoportography" of Tx

GILBERT syndrome

FAMILIAL Jaundice

DIRECT
(conju)

- (a) Dubin-Johnson syd.
- (b) Rotor syd.

INDIRECT
(unconju.)

- (a) Crigler najjar syd.
- (b) Gilbert

GILBERT SYD

- Autosomal Dominant
- (N) liver Histology
- (N) LFT
- mild unconjugated Hyperbilirubinemia

CRIGGLER NAZAR SYD. :-

- Autosomal Recessive
- less severe type
- Kericterus (rare) seen.
- UDP - Glucosyl transf. deficiency.
- phenobarbitone is useful

↓
Induce ENZYME (UDP)

HEMOLYSIS →

↳ characteristic - Rh comp. & ABO
↓
Incomp.

PBF finding = "Microspherocytes"

★ physiological Jaundice = peak after 48 hrs

★ Breast milk Jaundice = peak after 7 day

PHOTOTHERAPY :- / PATHOLOGICAL JAUNDICE

CRITERIA

- ↳ App. $\bar{c}$ in 24 hr "
- ↳ TSB above expected
- ↳ Persistent Jaundice Beyond 3 wks
- ↳ Conjugated Bilirubin

- ° APNEA ° -

↳ cessatn of Respiration/breathing
(>20sec).

→ Asphyxia ←

↓
Resp. movement ceased

1° Apnea (BP - (N))

Asphyxia
continues

↳ HR ↓

↳ Neuromuscular tone ↓

(+) — Tactile Resp Stimulatn.

Gasping or Respiratory efforts
Resp.

HR ↓

BP ↓

2° Apnea (+) — Ventilatory efforts.

↳ originate in CNS

DOC - recurrent Apnea = "caffeine" or
of Prematurity "Theophylline"

Mother
↓
Before delivery - "meperidine"
given 2 hrs prior
↓
Baby Apneic ??

MX

Meperidine = Narcotic & Administration of
of Narcotic to mother
shortly before delivery
↓
result in Resp^r
depression
in newborn

ix ⇒ Immediate ⇒ Bag & mask ventilⁿ
then it
substituted

+ Naloxone Hydro-
chloride

(Dose = 0.1mg/kg)
im or iv

⇒ POTTER'S SYNDROME :-

- △ - TRIAD -
- (A) Renal agenesis
 - (B) Oligohydramnios
 - (C) Pul. Hypoplasia

PIERRE ROBIN SYNDROME :-

- micrognathia
- Retrognathia
- Glossoptosis

CHARGE SYD :-

C = Coloboma of eye

H = Heart Anomaly

A = choanal Atresia (Back of Nasal

R = Retardation (Passage blocked)

G = Genital Anomalies

E = Ear Anomalies

VATER SYD :-

V = Vertebral defects

A = Imperforate Anus

T = T-E fistula

R = Radial & Renal dysplasia

BREAST JAUNDICE

Date _____
Page _____

"Breast feeding"

Breast milk Jaundice

- early ONSET
- unconjugated Hyper-Bilirubinemia
- occurs in 1st week (24-72 hr) after Birth
- D/t ↓ sed milk intake & Dehydratn & ↓ sed caloric intake
- Tx = continue B-feeding & supplementn & formula feed.

- unconjugated hyper-
- occur after 7 day
- max^m concⁿ as high as 10-30 mg/dl reach 2-3 week
- D/t presence of Glucosylidase in B. milk
- Tx = continue B-feeding & Bilirubin gradually ↓ se but may persist 3-10 wks. phototherapy may or may not be Require.

COLOUR

~~Red~~ SYNDROME :-

- (A) Bronz Baby syd = infants undergoing phototherapy (Dark, greyish Brown skin Discolouration)
- (B) Red man syndrome = Vancomycin (Adverse effects)
- (C) Grey Baby syd = chloramphenicol.

NECROTIZING ENTEROCOLITIS :-

Date _____
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- Common in Preterm babies
(mc in < 32 wks)

- mortality @ 40-50%.

- It mimick like of Neonatal
Septicemia.

- Abdominal distension

- Apnea

- Bradycardia

- cyanosis

- lethargy.

- Breast milk protects against NE.

& Antenatal Steroids

Clinical Features :-

→ illness devel. after 1st week

Stage I =

- unstable temp^r

- Apnea

- Bradycardia

- lethargy

X-Ray = mild intestinal distension

Stage II ⇒ clinical sign = similar to I.

⇒ Bowel sounds ↓ & or ↑ out Abdominal tenderness

→ Pathogenic

⇒ X-Ray ⇒ Pneumatosis Intestinalis

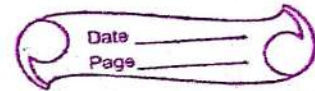
⇒ dilatation of intestine

Stage III ⇒

- Hemodynamic Instable

- Peritonitis

- Pneumoperitoneum



→ Distal part of small & proximal part of colon = most frequently involved.

⚡ - TRIAD

- (A) Intestinal ischaemia
- (B) Enteral nutrition
- (C) Bacterial translocation

Mx :-

- oral feeding if held
- NG tube = to relieve distension & to aspirate stomach contents.
- Parenteral nutr given
- fluid & electrolyte in adequate quantities should be administered
- Plasma & platelet transfusion
- Sx intervention = perforation

complication

⚡ = cause = Metabolic Acidosis