

INFANTICIDE

- **Foetus---** Product of conception from 8th week of intrauterine life up to birth.
 - **Neonate---** From birth to the first 28 days of extrauterine life.
 - **Infant---** From birth to 1 year of extrauterine life.
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- **Infanticide-** means the unlawful destruction of a newborn under the age of one year.
 - **Foeticide** -is the killing of foetus at any time prior to birth.
 - **Filicide-**is the killing of a child by its parents.
 - **Neonaticide-** is the deliberate killing of a newborn within 24 hours of its birth.
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- ❑ As per the provision of Indian law, birth of a newborn means when any part of it has come out of the maternal birth passage during labour.
- ❑ But according to English law (Infanticide Act of England 1938), it will not constitute birth, if complete expulsion of it from the mother has not occurred.
- ❑ As per Indian law, there is no difference between murder and infanticide. The offence is punishable under S.302 IPC.
- ❑ Infanticide does not include the death of foetus during labour, when it is destroyed by Craniotomy or decapitation.

Motives behind infanticide

1. Illegitimacy– Child born out of illegitimate sexual intercourse
as in –a) unmarried
b) widow.
 2. Poverty – to avoid additional financial liability.
 3. To lead carefree life: in early married life
 4. Female child- to avoid the liability of dowry during marriage.
 5. Male child- Prostitute mother can not like to carry burden of male child.
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Issues to be decided are -

- 1) Whether the infant has attained **viability** or not ?
- 2) Whether the child was **stillborn** or **dead born** or **born alive** ?
- 3) If born alive **how long** did the child survive?
- 4) If dead – caused by **act of commission or omission**
- 4) What was the **Cause of death** ?
- 5) Connection between the **identities** of the child and mother

Viability

- ▣ **Viability of foetus--** The physical ability of foetus to lead a separate existence after birth apart from it's mother, by virtue of a certain degree of development.
 - ▣ A foetus is viable after 210 days of intrauterine life and in some cases after 180 days.
 - ▣ Weight more than 1000 gm
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□ Haase rule (1895)

- Age (Mths) = $\sqrt{\text{length of foetus}}$ (Upto 5 mths)
- Age (Mths) = length of foetus / 5 (5 mths onwards)

□ Ossification centers:

Calcaneum 5th month, talas at 7th month and cuboid 9th months ,

lower end of femur at 9th month of intrauterine life.

STILLBORN OR STILLBIRTH

DEFINITION: A stillborn child is one, which is born after 28th weeks of pregnancy and which did not breath or show other signs of life at any time after being completely born.

- The child was alive in utero but dies during the process of birth.
 - The incidence is about 5 %.
 - Signs of prolonged labour i.e. oedema and bleeding into the scalp ,caput succedaneum and severe moulding of head indicate stillbirth.
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STILLBORN OR STILLBIRTH

Common causes

- 1) Prematurity
 - 2) Anoxia of various type
 - 3) Birth trauma
 - 4) Placental abnormalities
 - 5) Erythroblastosis foetalis
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DEAD BORN

DEFINITION: A dead born child is one which died in utero, and shows one of the following signs after it is completely born

1. Rigor mortis at delivery.
 2. Maceration
 3. Mummification
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Maceration

- Maceration is a process of aseptic autolysis.
- This occurs when dead foetus remains in uterus for about 3 or 4 days surrounded with liquor amnii but without air.
- Membrane will remain intact.
- Mother will be living
- If air enters the liquor amnii after death of the foetus, putrefaction occurs instead of maceration.

Signs of maceration are:

1. Body becomes soft, flaccid & flattens out when placed on table.
2. Skin slippage, earliest sign- after 12 hrs of death.
3. Gas in great vessels like aorta –12hrs.
4. Abdomen distended.
5. Bones & joints: lax & abnormally mobile.
6. Skull bones separated.
7. Collapse of vertebral column.

Spalding sign--- loss of alignment and overriding of the bones of cranial vault due to shrinkage of brain.

Mummification ---When the foetus dies from deficient supply of blood and liquor ammini is scanty.

Live born/ livebirth.

- It means that the child showed signs of life when only part of the child was out of mother.
- Death of such infants is consider as a homicide under the law

signs of life:

1. In civil cases—e.g. hearing of cry, seeing of movements of body, muscle contraction.
 2. In criminal cases- demonstrated after postmortem examination
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Signs of livebirth

1. **Shape of chest-** Before respiration chest is flat, after respiration chest is expand and become drum shaped.
2. **Position of diaphragm-** Before respiration at 4th or 5th ribs, after respiration 6th or 7th ribs.
3. **Lungs:** breathing causes important and permanent changes in the lungs
 - I. Volume: unrespired lungs appear smaller and being collapse. Respired lungs- fill the cavities and overlap the mediastinum and pericardium

II. Margins: unrespired lungs- sharp;
respired lungs- round margins

III. Consistency: before respiration lungs are dense, firm, and non-crepitant like liver. Respired lungs- soft, spongy, elastic and crepitant.

IV. Colour: before- uniformly reddish brown or deep violet. After- light red or pink and whole lung has a mottled or marbled appearance

V. Weight:

- a) **Static /Fodere test** –on establishment of respiration, weight of the lungs gets doubled i.e.30 to 40 gms before respiration to 60 to70 gms after respiration. The increase in weight is due to the increased flow of blood
- b) **Ploucquet's test---** on establishment of respiration, the ratio of the lungs and the whole body gets reduced to half, as compared to the said ratio before respiration. Before establishment of respiration lungs: body ratio is 1:70. After establishment of respiration lungs: body

VI. Hydrostatic test

- Principle
 - Test
 - Inference
 - Drawbacks
 - Test not required
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Principle

It depends on specific gravity of lungs d/t respiration.

- Specific gravity:

- Unrespired lungs-1050 (heavier than water) sinks in water.

- Respired lungs-950 (lighter than water) floats in water.

Test

Trachea with both lungs in situ



each lung



each lung cut into 12-15 pieces

Control: piece of liver.

Inference

- Sink-unrespired
Float-respired
Sink + float-feeble respiration
- Floating of lung pieces even after squeezing indicates positive hydrostatic test & establishment of respiration.

Drawbacks:

Expanded lungs sink:

1. Pneumonia
2. Pulmonary oedema
3. Congenital syphilis
4. Obstruction by alveolar duct membrane
5. More air is expelled out than inhaled
6. Complete absorption of inspired air in circulation

Unexpanded lungs float:

- putrefaction
 - artificial respiration
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Test not required

1. Baby born prior to age of viability
 2. Macerated foetus
 3. Monster
 4. Presence of milk in stomach
 5. e/o signs of inflammation & repair around umbilicus
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Difference in lungs before and after respiration

	Trait	Before respiration	After respiration
1	Weight	1/70 of body weight	1/35 of body weight
2	Volume	Normal or small	Larger and cover the heart
3	Consistency	Dense, firm ,non-crepitant	Soft, spongy, elastic, crepitant
4	Margins	sharp	Rounded
5	Colour	Uniformly reddish-brown or bluish-red	Mottled or marbled appearance
6	Air vesicles	Not inflated	Inflated
7	Section	Little frothless blood exudes on pressure	Abundant frothy blood exudes on section
8	Floattation	Whole and parts sink in water	Expanded areas or whole float in water

Signs of the struggle to breath

- The victims of the “struggle to breath” may be stillborn or they shortly died after delivery.
- Features suggest newborn struggled for breathing:
 1. Presence of dark coloured fluid blood, haemoconcentration & formation of soft clots.
 2. Cyanosed expanded lungs (d/t oedema, obstructive emphysema, inhalation of liquor amnii)
 3. Tardieu’s spots over visceral layers of pleura, pericardium & thymus.
 4. Hepatic & retroperitoneal oedema
 5. Ascites
 6. Distension of large gut with meconium

Respiration before and during birth

1. **Vagitus Uterinus and vagitus vaginalis**

2. While it's head is protruding from the outlet.

Microscopic examination of lungs

- Determining extent of respiration and presence of pulmonary disease or abnormality which may have caused or contributed to the death.
- No touch "technique of Osborn is used.
- At 4th months of pregnancy, the parenchyma of the lungs has gland like structure with a cuboidal or columnar lining.
- After 5th month air sacs filled with amniotic fluid.
- Thin walled adult type of alveolus before full term.

4. Changes in the stomach & intestine

- Air is swallowed in to the stomach during respiration.
- They float in water if respiration has taken, otherwise they sink this is known as **Breslau's second life test or stomach-bowel test.**

5. Changes in the middle ear (Wredin's test):

Before birth, the middle ear contains gelatinous embryonic connective tissue. With respiration, the sphincter at pharyngeal eans relaxes and air replaces the gelatinous substance .

This is not reliable test

Other signs of live birth

1. Changes in skin:

- ✓ At birth: bright red
 - ✓ 2 days: dark red
 - ✓ Between 3-5th day: yellowish d/t physiological jaundice
 - ✓ Resumes its original colour within 10th day.
 - ✓ Vernix caseosa: white cheesy substance, secreted from sebaceous glands & epithelial cells seen at neck folds, axilla & inguinal region. Persist 1-2days after birth if not washed out.
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2. Changes in umbilical cord

- ✓ umbilical cord normally fleshy, having spiral twist & glistening surface.
- ✓ Clotting at cut end: 2 hrs
- ✓ Begins to dry: 12-24 hrs
- ✓ Inflammatory ring at attached end: 36-72 hrs
- ✓ Cord dry & shrivelled: 3 days
- ✓ Falls off, leaving behind raw area: 5th day
- ✓ Healing of ulcer with formation of scar: 10th day.

3. Changes in circulation

1) Changes in RBC:

- Foetal RBC disappear 1-2 days after birth
- RBC count at birth 6.2millions reduces to 5.2 millions within a wk.

2) Changes in Hb:

- at 5th mths of IUL: 94% Hb is of HbF
 - at birth: 80%Hb is of HbF
 - at 6th mths after birth: HbF replaced by adult Hb.
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4. Changes in blood vessels

1. Beginning of contraction of umbilical arteries: few hrs after birth
2. Completion of contraction of umbilical arteries: 2 days after birth
3. Beginning of contraction of umbilical vein & ductus venosus: 2 days after birth
4. Completion of contraction of umbilical vein & ductus venosus: 4 days after birth
5. Beginning of contraction of ductus arteriosus from the aortic end: 4 days after birth
6. Completion of contraction of ductus arteriosus from the aortic end: 10 days after birth
7. Closure of foramen ovale: birth/2mth-2yr
(Persistent foramen ovale: "Morbus coeruleus").

5. Caput succedaneum –This is an area of soft swelling that forms in the scalp over the presenting part of the head.

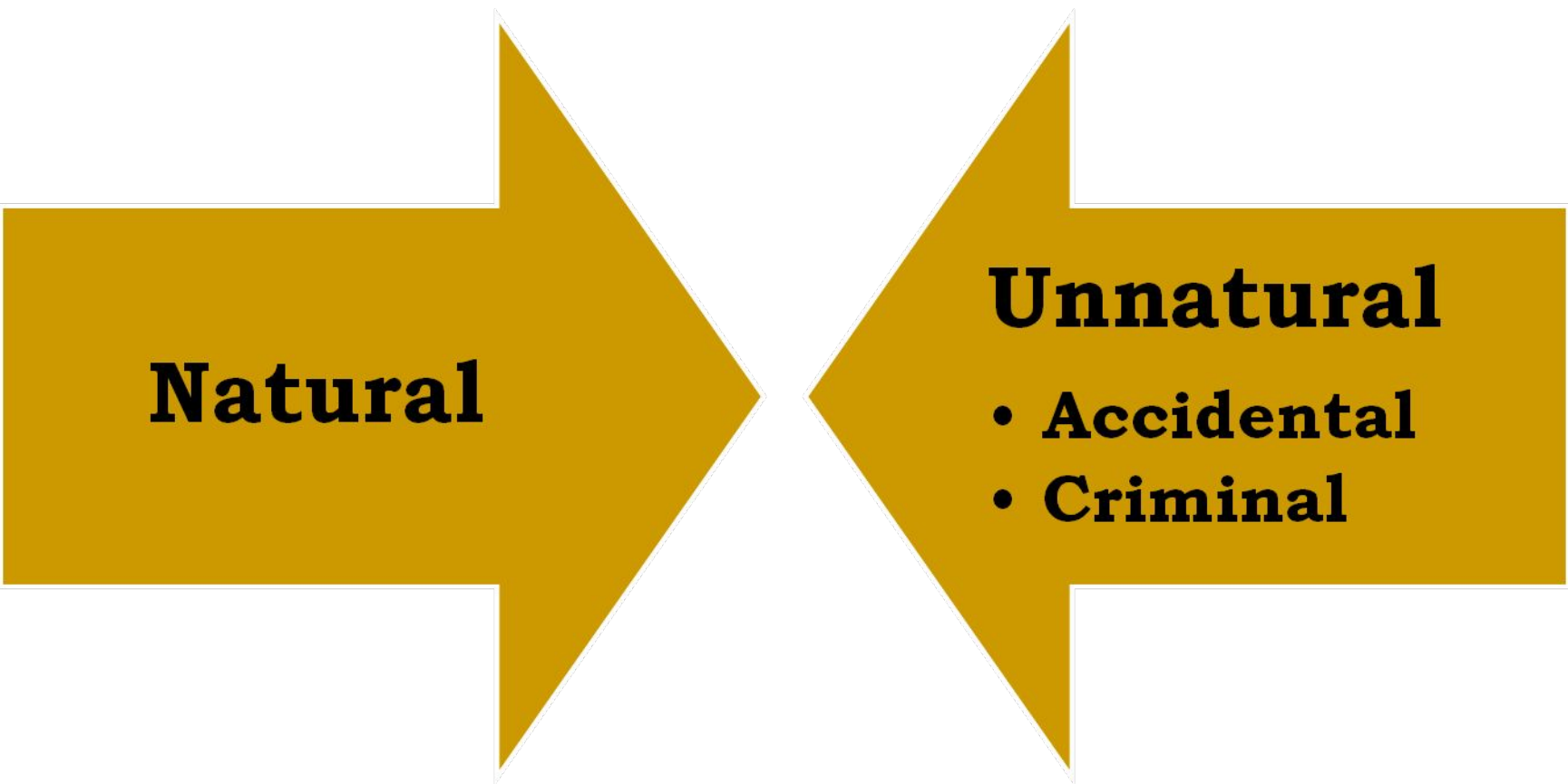
-- gradually disappears within a week after birth.

Cephalhaematoma –This is a localised accumulation of blood deep to the scalp, between the periosteum and bone surface which never crosses suture line.

6. Meconium: it is completely expelled from the lower part of large intestine within 1-2 days after birth.



Causes of death of infant



Natural

The diagram consists of two large, gold-colored arrows pointing towards each other, forming a central diamond shape. The left arrow contains the word 'Natural' and the right arrow contains the word 'Unnatural' followed by a bulleted list of 'Accidental' and 'Criminal'. The entire diagram is set against a white background with a thin gold border at the top and bottom.

Unnatural

- **Accidental**
- **Criminal**

Natural causes

1. Immaturity
 2. Debility due to lack of general development
 3. Congenital diseases
 4. Neonatal infections
 5. Diseases of placenta
 6. Erythroblastosis foetalis
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Unnatural causes

Accidental

1) During birth:

- Prolonged labour
- Prolapse of the cord
- Twisting of the cord round the neck
- Injuries to the mother
- Death of the mother

2) After birth:

- Suffocation
- Precipitate labour

Criminal causes

They are two types:

- A. Act of commission
- B. Act of Omission

Act of commission

1. Strangulation (by cord- displacement of Wharton's jelly /ligature)
2. Smothering(by pillow/cloth)
3. Throttling
4. Gagging
5. Banging the head against a wall
6. Burning
7. Drowning
8. Concealed puncture wounds (by needle at fontanelle, inner canthus of eye, axilla, vagina, rectum)
9. Poisoning

Act of Omission

- A woman is guilty of criminal negligence, if she does not take ordinary precautions to save her child after birth.
 1. Failure to protect the child from heat/cold
 2. Failure to provide assistance during labour
 3. Failure to clean air passage of mucus
 4. Failure to cut the umbilical cord
 5. Failure to feed the child

IPC RELATED TO INFANTICIDE

- SEC.317 IPC- **Abandoning of infant** –
Exposure & abandonment of a child under the age of 1yr, by parent /person taking care of it
 - SEC.318 IPC- **Concealment of birth-**
Concealment of a child by secret burying/disposal of a dead body
 - Infanticide is consider as murder and punished as 302 IPC
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Autopsy on infant

- Questions in cases of infanticide:
 - 1) Was the child still born/dead born?
 - 2) Was the child born alive?
 - 3) If yes, how long did the child live?
 - 4) What was the cause of death?

- Autopsy on infant: Rokitansky's evisceration technique

Autopsy on infant

- Rokitansky's evisceration technique
- Procedure:

External examination-

Clothes : for identity

Appearance of body

-Changes in skin, umbilical cord etc

-marks of violence over body

Maturity data

Malformation & birth injuries:

Malformation like hydrocephalus, spina bifida, cleft palate, patency of rectum

Birth injuries like scalp oedema, caput

~~succedaneum/cephal hematoma, moulding of head~~

Internal examination:

- Dissection in order of abdomen-----thorax-----head.
 - Skull opened by cutting with scissors AP & across & reflected as four flaps
 - In head, look for
 - injuries to fontanelle
 - tear to meninges
 - tentorial tear (d/t forceps delivery)
 - injury to brain
-

Ossification centre :(appears as pinkish colour of size 1.5mm at 9th mth

- Sternum with manubrium: Keep it on table & dissect along midline.
 - Knee joint: Take transverse incision over knee joint after flexing it---cut along articular surface.
 - Ankle joint: Incision between 3-4th toe.
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Examination of mother also necessary in cases of infanticide for:

- Signs of recent delivery
 - Abnormal delivery responsible for injury to newborn
 - Mental condition of mother
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Precipitate labour

It is a condition characterized by merging of all stages of labour resulting in rapid & sudden delivery without any prior warning.

Pre-requisites:

- multiparus woman
 - having roomy pelvis with small foetus
 - having old perineal tear
 - strong uterine contractions
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Precipitate labour

Features:

- Baby born with membranes covering the head
- Umbilical cord found to be torn
- E/o head injury
- Scalp hairs stained with foreign materials like mud/sand
- No e/o caput succedaneum/cephal hematoma

Cause of death:-Head injury

Pseudo-precipitate labour

- It is a condition usually occurs in primigravida d/t ignorance of nature & character of labour pain & mistaking the labour pain to be urge for nature's call & delivering the child during the act of nature's call.

Sudden infant death syndrome (SIDS)

Synonym: Cot death, crib death, SIDS.

DEFINITION: It is defined as sudden death of an infant which remains unexplained after thorough case investigation, including performance of complete autopsy, examination of death of scene & review of clinical history.

Predisposing factors:

1. Incidence: 2-3 / 1000 live births
2. Age: 2wks-2yrs (most common 2mth-4mth)
3. Sex: M > F
4. Common in lower socio-economic groups
5. Common in low birth babies, twins
6. Usually occurs in late night period
7. In many cases, there is prior h/o common cold/coryza

Aetiology: Hypothesis

1. Overlying of the infant by drunken parents
2. Prone sleeping position
3. Inadvertent smothering by soft cloth/pillow
4. Sleep apnea which causes hypoxia & respiratory depression
5. Hypotonic babies in which posture of neck reduces airway lumen
6. Dust mite allergy
7. Cows milk allergy
8. Ca/selenium deficiency

Autopsy

- The post-mortem findings are negative.
- The only constant findings are multiple petechial haemorrhages on the visceral surfaces of the heart, lungs and thymus.
- Many infants show froth in the air-passages and facial pallor.

Theories :

- 1) Prolonged “**sleep apnoea**” which makes them susceptible to hypoxia, which finally leads to bradycardia and cardiac arrest
- 2) Nasopharyngeal catarrh, bronchitis or tracheobronchitis of viral origin.
- 3) Other causes of death are conduction system anomalies, GORD, adrenal insufficiency.

Battered baby syndrome

- **Synonym:** Non-accidental injury of childhood, Caffey's syndrome, Child abuse syndrome, Maltreatment syndrome.
 - **DEFINITION:** A battered child is one that suffers repetitive physical injuries of different stages of healing inflicted by a parent/guardian which are non-accidental and non pathological in nature
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Factors relating to battering of child

1. Child factors:

- Age: between 2-5 yrs
- Sex: M>F
- Position of child: usually unwanted, illegitimate child

2. Parent factors:

- Lack of education, tolerance , understanding & self-control
- Lower socio-economic group
- Life style: habitually indulging to intoxication.

3. Precipitating factors:

- Frequently crying, refuses to take food, disobedient, persistently soils clothes.

Presentation

- Delay in production of victim for treatment.
 - History not tally with the injuries.
 - Injuries are superficial in nature (like abrasion, bruise or sometimes fracture).
 - Child treated by different physicians after each incidence of violence.
 - Child presented with different type of injuries with different stages of healing.
 - e/o old healed injuries over the body.
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- Multiple bruises are seen on cheeks mouth and neck.
 - Bite marks may be found on cheeks, shoulders, chest, abdomen, legs.
 - Bursting injuries of liver or spleen.
 - Multiple rib fractures are seen.
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- Differential diagnosis has to be made from scurvy, congenital syphilis, rickets, osteoporosis, osteomyelitis.
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Thank you...
