Infanticide

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1. Define & Discuss infanticide, feticide & Still birth.
2. Viability of fetus
3. Describe & discuss signs of intrauterine death,
4. Signs of live birth, hydrostatic test
5. Sudden infant death syndrome and Munchausen’s syndrome by proxy
Infanticide

Unlawful destruction of child under the age of 1 year
Historical Background

Infant killing was practiced in communities from the origin of humanity.
Infants killing

- To reduce population
- Physically & mentally handicapped children
- Child sacrifices to please God
Timeline of Fetus

Fertilization to implantation

Implantation to end of 8th weeks

End of 8th week to delivery

Birth to 1 year of age

1st 28 days after birth

Pre-embryo (14 Days)

Embryo

Fetus

Infant

Neonatal period
<table>
<thead>
<tr>
<th>FILICIDE</th>
<th>FETICIDE</th>
<th>NEONATICIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Killing of child older than 24 hours by its own parents</td>
<td>Killing of fetus at any time prior to birth</td>
<td>Killing of infant within 24 hours of birth</td>
</tr>
</tbody>
</table>
The English Infanticide Act, Section 1.

“A women by any wilful act of omission or commision causes the death of her child, but at the time of act the balance of her mind was disturbed by reason of not having fully recovered from the effect of giving birth to the child or by reason of effect of Lactation consequent upon the birth of the child, she shall be guilty of felony of infanticide and will be punished for manslaughter of child then.”

In Other circumstances were such that but for this act, the offense would have amounted to murder,
“Women”- offence of manslaughter only extends to mother, not father or any other person.

“cause the death of her child”- person with separate existence outside the mother’s body.
-child must be under 12 months of age
## Legal Scenario

### IN UK
- Infanticide Act of England 1938
- Killing of fetus is not considered as murder.
- Birth constitute complete expulsion of the child from maternal passage

### IN INDIA
- No Separate law for infanticide
- Considered as murder punished under **302 IPC**
- Birth constitute any part of the living child coming out of mothers birth passage
Illegitimacy
Unmarried girls / widows become pregnant
Married women living apart from husband
Poverty of parents
Occasionally d/t religious superstitions
Female feticide/infanticide
When a case of infanticide comes we have to resolve-

- Primary issues
- Secondary issues
Primary issues

✘ Child was capable of survival after birth

✘ Was born alive & had separate existence outside mother’s body

✘ Death was caused by wilful act or omission. (violence inflicted upon child to be differentiated from accidental injuries related to birth trauma)
Secondary issues

✘ Duration of life of child (degree of maturity)

✘ To prove mother has recently delivered. Period of delivery coincides with the probable duration of life of infant.

✘ Connection between the identities of the child & the mother required to be traced (ABO grouping & DNA)
Viability

‘Ability of the child to have separate existence after its separation from its mother’

Age of viability:

**In India = 28 weeks/ 210 days/ 7 months.** Some cases 180 days

**In USA = 20 weeks**

**In UK = 24 weeks**
Proof of viability

✗ General condition of infant
✗ Weight
✗ Head circumference
✗ Crown heel length
✗ Hasse rule
✗ Ossification centre
Upto 5 Months (Hasse’s Rule)

Age (mths) = \sqrt{L} (cm)

Last 5 months (Morrison’s Law)

Age = \frac{L}{5}

L = Crown heel length
Ossification center's

At 28\textsuperscript{th} week  Centre's of ossification in calcaneum & talus

At 30\textsuperscript{th} week  Sacral vertebrae

At 36\textsuperscript{th} week  Lower end of femur
Ossification centre’s in calcaneum & Talus

Courtesy – Dr Shiuli
Dead born

Still born

Live born
Still born

Born after 28 weeks of pregnancy & which did not at any time after being completely expelled from its mother, breathe or show any other sign of life

X Child was alive in uterus & died during the process of birth or just before.
Features of still born
(signs of prolonged labour)

- Moulding of head
- Edema & bleeding in scalp
- Caput succedaneum
Understanding the Differences

Caput Succedaneum
- Condition marked by localized soft tissue edema with poorly defined outline
- Caused by pressure of the fetal head against the cervix during labor, which decreases blood flow to the area and results in edema
- Present at birth; does not increase in size
- Swelling crosses suture lines
- Disappears after birth within a few hours to several days
- Complications are rare

Cephalhematoma
- Condition marked by soft, fluctuant, localized swelling with well-defined outline
- Caused by subperiosteal hemorrhage
- Appears after birth; increases in size for 2–3 days
- Swelling does not cross suture lines
- Disappears from several weeks to even months after birth
- Complications include defective blood clotting, underlying skull fracture or intracranial bleeding, and jaundice
Causes of Still birth

1. Intrauterine asphyxia
2. Placental abnormalities
3. Toxaemias of pregnancy
4. Erythroblastosis foetalis
5. Intracranial haemorrhage
6. Congenital defects
Dead Born

“One who died in utero before the birth process began”
Signs of Dead Born

- Rigor Mortis (*only seen when fetus >9 mnth*)
- Maceration
- Mummification
- Putrefaction
Signs of Maceration

✘ Aseptic autolysis
✘ Dead child in utero for 3-4 days
✘ Fetus is
  - soft
  - flaccid
  - flattened
  - emits sweetish disagreeable smell
Signs only seen after 12 hours

× Earliest is **skin slippage**
× Reddish or purplish coloration of skin
× Large blebs containing serous / sero-sanguinous fluid.
× Epidermis easily peeled off leaving moist greasy area.
× Turbid reddish fluid in serous cavities
✗ Abdomen distended
✗ Joints loose & Flexible
✗ umbilical cord red & soft
✗ Brain grayish, pulpy
✗ Other organ soft
✗ Collapse of vertebral column
✗ Crowding of ribs
✗ Spalding sign
✗ Roberts sign
✗ Deuel Halo’s sign.
Spalding Sign

- Loss of alignment & over-riding of bones of cranial vault.
- d/t shrinkage of brain after death.
Robert’s Sign

✗ Presence of gas shadow within heart or the greater blood vessels.

✗ Rare sign, caused by postmortem blood degeneration

✗ Seen 1-2 days after death

✗ May be seen as early as 12 hours
Deuel Halo’s Sign

- X-ray finding

- Zone of reduced density visible around the head of a relatively mature fetus before delivery appears separate from the cranium
FETAL CAUSES

- Multiple gestation
- IUGR
- Congenital anomalies
- Infections
- Hydrops (immune & non-immune)
- G6PD deficiency
- Birth Defects
Mummification

- Deficient blood supply & scanty liquor amnii. (no air entry)
- Fetus dry & shriveled
- Occurs after 2 weeks of IUD
Putrefaction

- Membrane are ruptured & dead fetus remains inside uterus
- Signs of putrefaction appears-
  - marbling
  - Greenish discoloration
  etc.
Still born  
Dead born  
Still born  
Live born
<table>
<thead>
<tr>
<th>S.No</th>
<th>Features</th>
<th>Still Born</th>
<th>Dead Born</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Gestation Period</td>
<td>&gt;28 weeks</td>
<td>Any</td>
</tr>
</tbody>
</table>
| 2.   | Condition in uterus       | Live-in – uterus  
Died during the process of birth | Dead in utero                                   |
| 3.   | Predominance              | Mostly among illegitimate & immature male child  
& in primipara                                 | No such predominance                           |
| 4.   | Cardinal Features         | Signs of prolonged labor                        | Any one of the following(maceration/mummification/RM etc) |
| 5.   | Cause                     | Anoxia, aspiration, birth trauma, prematurity,  
strangulation, toxemia etc                     | Congenital anomaly, ABO & Rh incompatibility   |
Live born!

“According to Indian law “
Child will be regarded as born alive when any part of the living child has come out of mother’s birth passage even though the child is not fully born.
Proof of live birth
(separate existence)

“Breathing is Living”

Onset of respiration is the beginning of (extra-uterine/independent) life.

-Barcroft
Law Presumes

“Every Newborn child found dead was born dead until the contrary is proved”
Signs of live birth
In Civil Cases

- Cry of child,
- feeling, seeing,
- hearing of heart beat
- slight muscular movements
  (twitching of eyelids, pulsating cord)

**** Exceptions
Exception
Proof of breathing is not proof of life

Vagitus Uterinus
Cry of the child when the head is still in the uterus

Vagitus Vaginalis
Cry when the head is in the vagina

In immature fetus respirations are not strong enough to expand the air cells, so child may live for some time (hours or 1-2 days)
In Criminal Cases

Signs of live birth to be demonstrated by postmortem examination
1. Shape of chest & its measurement.
2. Changes in skin
3. Caput Succedaneum / Cephalhematoma
4. Changes in the umbilical cord
Internal Signs

1. Position of highest point of diaphragm
2. Examination of Lungs----- Ploucquet’s Test
   Hydrostatic Test
3. Findings in the stomach & Intestine----- Breslau's Second life Test
4. Meconium
5. Changes in Heart
6. Changes in blood vessel
7. Others
External signs

1. Shape of chest & its measurements:

**Respiration established**

Increase AP diameter & circumference *(Drum shaped)*.

circumference greater than abdomen.

intercostal spaces wider.

**Respiration not established**

Flat, circumference less than that of abdomen, intercostal spaces narrow.
Changes In Skin

Color:  
- **Bright red** - At birth
- **Brick Red** – 2\textsuperscript{nd} to 3\textsuperscript{rd}
- **Yellowish** – 3\textsuperscript{rd} to 6\textsuperscript{th} day
- **Normal** - 7\textsuperscript{th} to 10\textsuperscript{th} day

Desquamation of skin:  
- Begins over abdomen by 2\textsuperscript{nd} day
- Completed by 3\textsuperscript{rd} to 4\textsuperscript{th} day
Vernix caseosa

“A white cheesy substance made of sebaceous secretions & epithelial cells”

✘ Cannot be removed easily
✘ Mainly present in the flexures of joints & neck folds
✘ Persists for a day or 2
Caput succedaneum

Cephalhematoma
<table>
<thead>
<tr>
<th>Cephalhematoma</th>
<th>Caput succadaneum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft, fluctuant, localized swelling</td>
<td>Localized soft tissue edema</td>
</tr>
<tr>
<td>Defined</td>
<td>Ill defined</td>
</tr>
<tr>
<td>Subperiosteal hemorrhage</td>
<td>D/T decrease blood flow of the area</td>
</tr>
<tr>
<td>After birth, size increases for 2-3 days</td>
<td>At birth</td>
</tr>
<tr>
<td></td>
<td>Do not increase in size</td>
</tr>
<tr>
<td>Do not cross suture line</td>
<td>Swelling crosses suture line</td>
</tr>
</tbody>
</table>
Changes in the Umbilical cord**

2 Hrs : Cut margin dries
12-24Hrs : Cord dries
36-48hrs : Red ring (inflammatory) appears (around umbilicus)
2\textsuperscript{nd}-3\textsuperscript{rd} day : Shrivels up
5-6\textsuperscript{th} day : Mummifies & falls off leaving a raw area
10-12 days : Raw area heals & cicatrizes

**in putrefied bodies these changes will be present
Internal examination

1. Position of highest point of Diaphragm:

Abdomen to be open before thorax.

No respiration---Diaphragm at level of 4th or 5th rib

Respiration Established- Level at 6th or 7th rib
2. Examination of lungs:
<table>
<thead>
<tr>
<th>Features</th>
<th>Respired Lung</th>
<th>Unrespired Lung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td>Fill the thoracic cavity, overlap heart with taut covering pleura.</td>
<td>Lying at behind of thoracic cavity behind the heart, covering pleura wrinkled and loose</td>
</tr>
<tr>
<td>Volume</td>
<td>Voluminous</td>
<td>Small</td>
</tr>
<tr>
<td>Edge/margin</td>
<td>Rounded</td>
<td>Sharp &amp; clearly defined</td>
</tr>
<tr>
<td>Color</td>
<td>Mottled pink</td>
<td>Reddish brown or bluish</td>
</tr>
<tr>
<td>Appearance</td>
<td>Marbled</td>
<td>Smooth &amp; not marbled</td>
</tr>
<tr>
<td>Consistency</td>
<td>Spongy, elastic &amp; crepitant</td>
<td>Dense, firm liver like &amp; non-crepitant</td>
</tr>
<tr>
<td>Features</td>
<td>Respired lung</td>
<td>Unrespired Lung</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Microscopy</td>
<td>Alveoli Expanded, lined with flat squamous epithelial cell with prominent vascularity. Alveolar duct membrane may be present.</td>
<td>Alveolar sac closed, lined with cuboidal/columnar cells, less vascularity. Alveolar duct membrane absent.</td>
</tr>
<tr>
<td>Cut-section</td>
<td>Exudes frothy blood</td>
<td>Little blood &amp; no froth</td>
</tr>
<tr>
<td>Weight-Body ratio</td>
<td>1/35 of body weight</td>
<td>1/70 of body weight</td>
</tr>
<tr>
<td>Extraneous material in the lungs</td>
<td>Present in distal respiratory passage(secondary bronchi and beyond)</td>
<td>Absent</td>
</tr>
</tbody>
</table>
Foder’s Test

X  Weight of lung (before respiration)
   30-40 gm

X  Weight of lung (after respiration)
   60-70 gm

X  d/t filling up of pulmonary blood vessel with the blood.
Ploucquet Test

* Ratio of weight of lung & body
  1/70 before establishment of respiration

  1/35 after establishment of respiration
Hydrostatic test / Raygat’s Test

By Schreyer in 1683

Principle:

Specific gravity of unrespired lung is 1.04-1.05

& that of respired lung is 0.94, so unrespired lung sinks in water and those respired floats
Whole lungs with trachea, heart & thymus
Put each lung in a separate container

Right lung

Left lung

If they float
Cut each lung into small pieces (15-20 pieces) & separately put in water. If they float...
Squeeze the lung pieces between thumb and index finger under water to see if air escapes.

If they float
Wrap the pieces in a cloth and place a weight over it, without crushing it.

On applying weight tidal air escapes but not the residual air.
1. If all lung pieces float after applying pressure—respiration had been established
2. Some of the pieces float—partial inflation of lung, baby lived for short period of birth. & partially resired
3. Whole lung & cut pieces sink, respiration had not been established.
Fallacies of hydrostatic test

**Respired Lung may sink (False Negative)**
1. Acute pulmonary edema
2. Bronchopneumonia
3. Atelectasis
4. Alveolar duct membrane
5. Very feeble respiration

**Unrespired Lung may float (False Positive)**
1. Presence of decomposition gases
2. Artificial respiration
3. Mouth to mouth insufflation
Hydrostatic test has no relevance

1. Child not viable
2. Shows signs of maceration
3. Decomposed fetus
4. Milk in stomach
5. Umbilical cicatrization
6. Monster fetus
Other tests for separate existence

1. Breslau's 2\textsuperscript{nd} life test:

Air in stomach & intestine (by double ligatures)

False Positive:
Resuscitation
Putrefaction
Survival period:

Within 15 mins-----Air in stomach
1-2 hrs------air in intestine
5-6 hrs------In Colon
12 hrs------in Rectum
Changes in the Middle air

Wredin’s Test:

Gelatinous substance in middle ear replaced by air through Eustachian tube
Circulation

Umbilical Artery closes---3\textsuperscript{rd} day
Umbilical Vein closes----4\textsuperscript{th} day
Ductus arteriosus-----10\textsuperscript{th} day
Foramen Ovale—2-3 months
Presence of milk/honey/meconium/blood in stomach

Large intestine is completely free of meconium within 24hrs after birth
Meconium

4th month – upper small intestine.

5th month - Beginning of large intestine
7th month-Entire large intestine

9th month-End of large intestine
Darkest **Strias of Retzius**-occurs at time of birth, due to stress of birth.

Seen only in deciduous teeth & first permanent molars

Separates perinatal enamel from postnatal enamel.

Quality of perinatal enamel is better than postnatal enamel.

“**Incremental lines in the enamel of teeth – one of surest sign of live birth**”
- Presence of some ossification center's
- Nucleated RBC's disappear within 24hrs
- Fetal hemoglobin 55% to 60 % at birth
- Closure of fontanelles
Cause of infant Death

A. Natural

B. Unnatural: Accidental Criminal
Natural causes

1. Immaturity
2. Congenital diseases (syphilis, small pox, rubella etc)
3. Post maturity
4. Placenta praevia
5. Pre-eclamptic Toxemia
6. Abruptioplacenta
7. Fetal asphyxia
8. Erythoblastosis
Unnatural Causes
(Accidental)

× Prolapse of cord
× Knots of cord
× Twisting of cord around neck
× Prolonged labour & severe moulding of head
× Membranes covering face & accidental suffucation
× Precipitate labour
Prolapse of cord
Cord around the neck
“When the combined duration of 1\textsuperscript{st} and 2\textsuperscript{nd} stage of labor is less than 2 hours which results in rapid expulsion of baby”
Fetus may be normal /premature
In multipara with large roomy pelvis

Confuses with nature’s call, & infant gets drowned in the lavatory pan.

Infant may aspirate mud, blood, meconium & foreign body
Umbilical cord 50cm long, so delivery in standing position baby will never touch ground.

Umbilicus strong enough to hold baby weight.

If breaks always at fetal end and not at placental end and nevers breaks from middle.

No caput succedaneum or moulding.
Examination of mother:

- Signs of recent delivery
- Roomy pelvis
- Old healed perineal scars

Examination of the baby:

- Absence of moulding
- Evidence of mud, gravel or sand
- Baby seen with cord & placenta
- Cord torn & never cleanly cut
- Evidence of drowning (if delivery in lavatory pan)
<table>
<thead>
<tr>
<th>Features</th>
<th>Head injury in precipitate labor</th>
<th>Head injury due to blunt trauma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contusion</td>
<td>At presenting part</td>
<td>Anywhere on scalp</td>
</tr>
<tr>
<td>Laceration</td>
<td>Absent</td>
<td>May be present</td>
</tr>
<tr>
<td>Fracture</td>
<td>Fissured fracture (parietal)</td>
<td>Comminuted &amp; depressed fracture</td>
</tr>
<tr>
<td>Brain</td>
<td>Usually not injured</td>
<td>Contusion, laceration &amp; hemorrhage may be seen</td>
</tr>
</tbody>
</table>
# Criminal causes of infant death

## Acts of commission

1. Smothering
2. Strangulation*
3. Gagging
4. Drowning
5. Head injury
6. Cut throat wound /stabs
7. Concealed punctured wound
8. Fractured dislocation of cervical vertebrae
9. Poisoning
10. Live burial

## Acts of omission

1. Failure to remove membranes from face
2. Failure to ligate the cut end of umbilical cord
3. Failure to protect from heat & cold
4. Failure to feed the baby
Concealment of birth (Sec. 318 IPC)

Whoever, secretly buries or otherwise dispose the dead body of a child, whether such child dies before or after or during its birth, intentionally conceals birth of such a child, shall be punished with imprisonment up to 2 years.
Father / Mother of a child who is under 12 years, or anyone who is having care of such child, leaves such child in any place with the intention of abandoning the child, shall be punished with imprisonment up to 7 years.
Battered baby syndrome

× Caffey ‘s syndrome
× Maltreatment syndrome
× Child abuse syndrome

“Child is getting repeated physical injuries due to non accidental violence from parents /guardian”
1st noted by Ambroise Auguste Tardieu in 1860.

John Caffey (pediatric radiologist) in 1946
Classical feature of battered baby syndrome

4 D’s

Discrepancies of injuries & history provided
Delay between injury & medical attention
Different dates - repetition of injuries
Deprivation of nutrition, care & affection.
☒ Usually <3 years
☒ Lower socioeconomic status
☒ Unwanted child
Multiple bruises of different age
Abraded contusions
Pinch marks as butterfly shaped bruises
Lacerations in inner aspects of lips & frenulum tear
Bald patches on hair
Cigarette butts burn marks
Bite marks
Subconjunctival hemorrhage, retinal separation, lens displacement, black eye
Subdural hemorrhage D/t violent shaking of head
Visceral injuries
Blunt trauma to chest, rib fractures, hemothorax, diaphragm ruptured etc.
Skeletal injuries: periosteal separation, fracture with callus of different age
‘string of beads”
Nobbing fractures (rib fractures on posterior aspect close to spine)
Differential diagnosis

✗ Scurvy
✗ Rickets
✗ Juvenile osteoporosis
✗ Congenital syphilis
✗ Osteogenesis imperfecta etc.
Shaken baby syndrome (Infantile whiplash syndrome)

SBS is a brain injury caused by excessive shaking.
The Shaken Baby Syndrome triad

- Retinal hemorrhaging
- Brain swelling
- Subdural hematoma

ALBERTO CUADRA/
THE WASHINGTON POST
Munchausen’s Syndrome

Feigning illness or injury & going from hospital to hospital for unnecessary investigation and treatment
Munchausen’s Syndrome by Proxy

Action of one person (usually mother) who inflicts harm against another person (usually an infant or small child) in an attempt to gain sympathy & attention for both of her own & child’s suffering
Sudden infant death syndrome (SIDS) (Cot / Crib Death)

✗ Sudden death of an apparently healthy infant under 1 year of age.

✗ Remains unexplained after a thorough forensic autopsy and detailed death scene investigation

✗ Incidence=0.2-0.4%
1. **Age group** – 2-6 months
2. **Premature birth**
3. High preponderance in winter season
4. **Sex** - M:F=3:2
5. **Social status** - lower and middle class
6. Bottle fed babies more prone
7. Smoking & alcoholism during pregnancy
8. **Time of death** - death possibly occurring at late night or after sometimes of 1st feeding of the infant in the morning
Precipitating causes

1. Prolonged sleep apnoea - presently accepted as the most countable of the suggested cause
2. Local hypersensitivity of respiratory tract
3. Viral infection
4. Bed clothes and pillow falling accidently over mouth
5. Prone position
6. Overlying
Autopsy

× Blood stained froth at nostrils

× Petechial hemorrhages on surface of heart, lungs & thymus

× Evidence of laryngitis, tracheitis, bronchitis, pleuritis

× No specific features
Precautions to prevent SIDS

- Proper ventilation
- Dust free atmosphere & optimum temp.
- Don’t place child on prone position
- Avoid soft bedding
- Avoid bed sharing with mother during sleep
Medicolegal importance

- Cot death being **natural** or very occasionally **accidental**, the parent may be wrongfully linked for having criminal involvement or negligence

- Some criminal infant death cases may be presented as natural cot death cases
thanks!

Any questions?

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