FETAL MONITORING

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LOOK AT THE FOREST BEFORE EXAMINING THE TREE

- SIMPLIFYING FETAL MONITORING
- BY A FETAL MONITORING SKEPTIC
- HECK I REMEMBER WHEN WE DIDN'T HAVE THIS AND STILL PRACTICED GREAT OBSTETRICS

WHAT WE ARE GOING TO DISCUSS

- FHR IS A REFLECTION OF WHAT IS HAPPENING TO THE FETUS INTRAUTERINE
- SUBJECT TO INTERPRETATION
- HAS PHYSIOLOGICAL BASIS

WHAT DO WE REALLY WANT TO KNOW FROM FHR

- IS THE FETUS DOING WELL?
- IF FETUS IS NOT DOING WELL, WHAT IS PUTTING IT IN JEOPARDY
- CAN WE DIAGNOSE WHAT IS GOING ON AND CORRECT IT

WHAT DOES THE FHR MONITOR ACTUALLY MONITOR?

- LEVEL OF OXYGEN, CARBON DIOXIDE
- ITS EFFECTS ON THE FETAL CNS AND MYOCARDIUM
- THE REST IS ALL SUBJECT TO INTERPRETATION

OXYGEN

- MOTHER HAS TO GET IT
  - ASTHMA, SEIZURES,
- PLACENTA HAS TO EXTRACT IT
  - ABRUPTION, HYPERTENSION
  - IUGR
- CORD HAS TO TRANSPORT IT
  - PROLAPSE
- BABY HAS TO USE IT

WHAT REALLY HAPPENS WITH 02 IN THE PLACENTA

- IT DIFFUSES FROM MOMS BLOOD TO FETUS
- DEPENDS ON A PLACENTA'S HAVING ENOUGH DIFFUSION AREA TO GET ENOUGH O2
  - ACUTE ABRUPTION
  - CHRONIC IUGR

UTERINE FACTORS IN O2 TRANSPORT

- BLOOD FLOW DECREASED
  - DURING CONTRACTIONS
  - INCREASED VASCULAR RESISTANCE
    - HYPERTENSION
  - HYPOTENSION
    - ANESTHESIA

FETUS'S ROLE IN 02

- COMPENSATORY MECH.
  - REDISTRIBUTES BLOOD
  - CONSUMES 50% LESS 02 WHEN STRESSED
  - SWITCHES TO ANAEROBIC METABOLISM
  - FETAL HEMOGLOBIN'S AFFINITY FOR O2

FETAL CARDIOPULMUNARY SYSTEM

- BRAIN AND HEART GET PREDOMINATE BLOOD FLOW
- FHR CONTROLLED BY PARASYMPATHETIC SYSTEM
  - ACETYLCHOLINE
  - DECREASE HEART RATE
  - CAUSE BEAT TO BEAT VARIABILITY
  - SYMPATHETIC SYSTEM INCREASES FHR

HOW DOES THE FETUS SENSE 02 DEPRIVATION

- CHEMORECEPTORS IN THE CAROTIDS
  - SENSE DECREASED 02
  - BEGIN THE PROCESS OF DECREASING HEART RATE
  - REDISTRIBUTING THE BLOOD FLOW

FETAL CARDIAC OUTPUT

- STABLE OUTPUT ORDINARILY
- BUT AT EXTREME RANGES
  - BRADYS OF 60
  - TACHYS OF 220
    - MARKED DECREASE IN FETAL BLOOD FLOW

FETAL RESPONSE TO HYPOXIA/ASPHYXIA

- REDISTRIBUTION
- BRADYCARDIA
  - ABOUT 30 BEATS BELOW BASELINE
- ACIDOSIS
  - ANAEROBIC (LACTIC ACID)
  - RESPIRATORY (CO_2 BUILDUP)
- MAINTAIN 45 MINUTES

SEVERE ASPHYXIA

- COMPENSATORY RESPONSE BREAKDOWN
- DECREASE CARDIAC OUTPUT
- DECREASE BLOOD PRESSURE
- DECREASE BLOOD FLOW TO BRAIN AND HEART
- CARBOHYDRATES PROTECTIVE
  - IUGR AND PREMIES DO WORSE

OTHER METHODS OF DETERMINING FETAL WELL BEING

- SCALP STIMULATION
  - SUSPECT FETAL ACIDOSIS?
    - DON'T NEED FETAL BLOOD SAMPLE
      - DIFFICULT TO DO FOR LAB
      - INVASIVE
      - NOT NECESSARY
    - STIMULATE SCALP
      - LOOK FOR 15 BEAT 15 SEC ACCEL
      - PH BETWEEN 7.23-7.33

VARIABILITY IS THE KEY IN LATES

- LATES WITH VARIABILITY
  - LESS ACIDOTIC
  - VAGAL REFLEX CASES LATES
- LATES WITHOUT VARIABILITY
- WORSE ACIDOSIS
- MYOCARDIAL HYPOXIA

LOOK AT THE FOREST

- DECREASING VARIABILITY
  - ALWAYS PRECEEDED BY
    - LATE DECELERATIONS
    - VARIABLE DECELS (SEVERE)
    - BRADYCARDIA
  - FETUS GOING FROM HYPOXIA TO ACIDOSIS
    - ANCILLARY TEST
    - INTERUTERINE CORRECTION
    - DELIVERY

TO HELP CLEAR UP QUESTIONS

- USE OTHER TEST IF:
  - PUT MONITOR ON AND BAD STRIP
  - ABSENT VARIABILITY
  - LATES WITH DECREASING VARIABILITY
  - VARIABLES WITH DECREASING VARIABILITY

VARIABILITY IS THE KEY

- THE PRESENCE OF NORMAL VARIABILITY IS EVIDENCE THAT YOU WILL IN ALL LIKELIHOOD DELIVER A HEALTH FETUS

IF THE FHR IS NOT NORMAL

- BRADYCARDIA
  - INITIAL RESPONSE TO ACUTE HYPOXIA OR ASPHYXIA
    - VAGAL ACTIVITY
      - CHEMORECEPTORS
    - BELOW 110 FOR GREATER THEN 10 MINUTES

TACHYCARDIA

- >160 BEATS PER MINUTE
  - LASTING 10 MINUTES OR MORE
- DUE TO SOME OTHER REASON THAN HYPOXIA
  - CHORIOAMNIONITIS MOST COMMON REASON

HOW DO WE GET VARIABILITY AND WHAT HAPPENS?

- CARDIAC CENTERS IN THE BRAIN SEND STIMULATORY SIGNALS TO HEART
- ASPHYXIA OF CEREBRAL CORTEX DECREASE THIS INPUT
  - EVIDENCE THAT COMPENSATORY MECHANISM ARE BREAKING DOWN

IF VARIABILITY IS PRESENT

- NO CEREBRAL HYPOXIA
- EVEN IF THERE ARE LATES OR SEVERE VARIABLES
- BUT IF CONTINUE LONG ENOUGH CEREBRAL HYPOXIA AND ASPHYXIA WILL ENSUE

GREAT TIP ABOUT FETAL MONITORING

- IF YOU SEE A DECREASE IN VARIABILITY AND CAN'T FIND A BENIGN CAUSE (I.E. NARCOTICS)
  - SIGNS OF ASPHYXIAL PATTERNS
    - LATE DECELS
    - SEVERE VARIABLES
    - BRADYCARDIA
- BE PREPARED TO CORRECT OR DELIVER!!!!!!!

THE BOTTOM LINE: A DAMAGED FETUS OR AN UNNECESSARY C/S

- LOOK FOR EARLY SIGNS
  - 0.25 % OF BABYS GET CEREBRAL PALSY FROM INTERPARTUM EVENT
  - OVERCALLING FHR PATTERNS
    - VARIANT PATTERNS 100 TIMES MORE COMMON THEN ACIDOSIS
    - DECREASED VARIABILITY 10 TIMES MORE COMMON

ASPHYXIA ENOUGH TO CAUSE BRAIN DAMAGE

- REDUCED 02 CONTENT
- INCREASED CO2 TENSION
- REDUCED PH (<6.8)
- LONG DURATION (1HR) (BASE EXCESS 25MEQ/L)

ASPHYXIA HEADED OFF AT THE PASS

- DELIVER OR CORRECT REPETITIVE LATES WITH DECREASE OR ABSENT VARIABILITY
- DELIVER OR CORRECT SEVERE BRADYCARDIA (60 BEATS OR LESS) WITH DEC OR ABS VARIABILITY

VARIABILITY IS THE KEY ARE YOU GETTING THE IDEA

- IT IS THE PRIME INDICATOR OF FETAL WELL BEING
- BABYS DO NOT DIE IF THEY EXHIBIT GOOD VARIABILITY
- BABYS DO NOT HAVE BRAIN DAMAGE IF THEY HAVE GOOD VARIABILITY