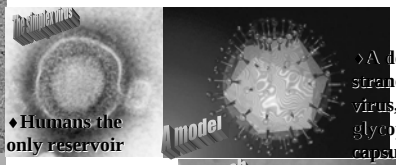
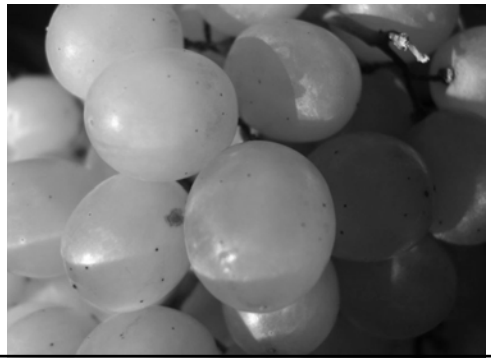
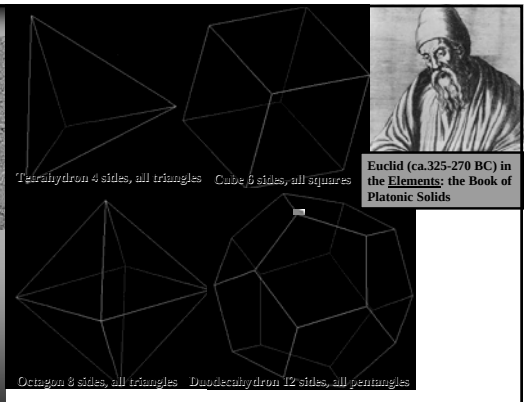
Neonatal Herpes, An Approach



- Humans the only reservoir
- A double-stranded DNA virus, *icosahedral* glycoprotein capsule
- Seen late in an infection

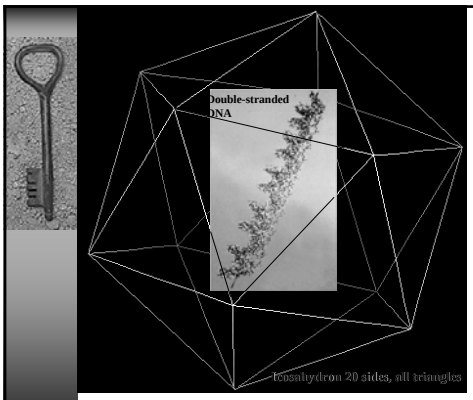
Green grapes are vessicular





Euclid (ca.325-270 BC) in the Elements: the Book of Platonic Solids

5 Platonic solids



The 5th Element -- HSV

Approach, setting the tone

- **"White man fool Indian once, shame on white man"**
- **White man fool Indian twice , shame on Indian", Grandpa Guenther from Iowa when there *still were* plains Indians – *ie*, don't get fooled twice by herpes**
- **Herpes knows more Indian tricks than the Indians did**
- ***EG, Routine* Hot Babe: 16 day newborn from ER presented febrile, R/O sepsis, routine cultures sent, given 1st dose antibiotics (Amp & gent or cef) for 3 day rule-out sepsis; consider herpes, ask lab to add CSF.PCR, & send NP & rectal swabs for virus, ask Mom for her history of genital lesions <u>and</u> for her OB's name or Delivery hospital, check CSF protein & cells yourself, check CBC for platelets & watch for seizures, consider LFT's**

Epidemiology

- **2% of susceptible women acquire it during pregnancy [as a 1º infection] & are usually (>50%) asymptomatic**
- **33-50% of these transmit vaginally with SVD**
  - **95% of all neonatal infection follows vaginal transmission**
  - **Only ~5% are likely to occur as an ascending infection**
- **Transmission of 2º maternal herpes is <5%**
- **¾ neonatal herpes occurs with <u>no</u> maternal history**
- **1/3,000-20,000 of all live births (U.S. 4 million/yr) will develop infection (more often in preterms 32-37 wks)**
  - **200-1300 cases per year nationally, I estimate 12-14 our region**
  - **75% are type 2 genital, have worst outcomes, especially CNS**
  - **25% are type 1 oral, more likely to recover, especially SEM**
- **Siblings with 1º syndromes can also transmit, but rare**
  - **gingivostomatitis**

Neonatal Clinical

Contradictory presentation, think herpes!

- **1/3 present as disseminated infection in 1st week of life (septic with aseptic blood cultures)**
  - **Liver [elevated enzymes, > 10X normal=lethal]**
  - **Lungs [severe respiratory symptoms, hemorrhage]**
- **1/3 present as CNS week 2-3: !seizures (common) & encephalopathy or !fever (an unusual sign in neonates) & irritability (with aseptic CSF culture, but have cells and protein suggesting an infection)**
- **Only 1/3 present as SEM: skin-eye-mouth infection, with vesicles, ulcerative membranes, conjunctivitis**


Vesicles not pustules, erythematous base


Vermillion boarder & mucous ulceration


Keratoconjunctivitis, blepharitis, folliculitis

Neonatal Pearl

Thinking !sepsis, !sepsis, sepsis! may be wrong!

- **Think missed heart disease (HPLHS with ductal closure, really big acidosis)**
- **Think metabolic disease (low platelets)**
- **Think adrenal hyperplasia (shock with hyperkalemia)**
- **THINK HERPES (with all of these signs!)**
  - **Big acidosis**
  - **Thrombocytopenia**
  - **Shock with hyperkalemia**

Do as I say, not as I do slide!

Think sepsis, heart, metabolic, adrenal, & herpes

The Mother

The most often omitted information is the history of a mother with genital lesions!

- **Might be 1º infection**
  - **Most often history of other STD's**
  - **Ask for maternal glycoprotein B antibody titers and type**
    - **If lacking, it's likely a 1º infection, high risk of transmission to baby >50%, type2 genital, and likely disseminated or CNS virulence at 1 or 2 weeks of life**
- **Might be 2º recurrent infection**
  - **Maternal antibody titer present indicating more likely recurrence with much lower <5% risk transmission, +/- prophylaxis**
- **Might not be known and baby has skin lesions at birth**
  - **SEM unusual until later in the infection Might be 2º infection in Mom**
- **C-section <4-6 hour ROM if new 1st lesions, no scalp clips if vaginal delivery, conundrum if premature ROM or labor with lesions, consider C-section &/or acyclovir prophylaxis for mother**

Do as I say, not as I do!

Work-up

Think !culture, !culture, cultures!

- **Culture vessicles (duh!)**
- **Mouth and NP and eye, rectal and stool and ETT if intubated (HSV pneumonia with RDS)**
- **CSF (send PCR, duh!)**
  - **CT/MRI/EEG**
- **Blood (send for culture and PCR)**
- **Obtain surface cultures >12-24 hours after birth in SVD asymptomatic baby of mother with genital lesions**
- **CBC/platelets, liver enzymes (duh!)**
- **Neonatal titers likely irrelevant, my opinion**

Treatment: Acyclovir

We know to start, but not to stop!

- **60 mg/kg/day divided q 8 hours**
  - **2 weeks skin**
  - **3 weeks disseminated or CNS infection**
- **Stop if PCR negative (well duh!)**
- **Stop only after repeat CSF.PCR negative in CNS disease, *ie* do the tap!**
- **Stop if cultures negative 48 hours if HSV is suspected only**
- **Long term PO suppression of SEM to prevent disseminated recurrences is under study**
- **Ophthalmologic herpes add vidarabine 3% drops**

Take home

Do as I say, not as I do!

- **Do the tap, send the PCR if you think of it, send CSF culture for virus too**
- **Send cultures NP & REC cultures at the very least if not sure, but only after 24 hours from birth; if missed tap, culture everything!**
  - **Ask for maternal history: Mom & her OB**
- **Acyclovir is not like an Amp & gent reflex, start if dying septic or truly seizing encephalitic, or any culture is HSV+ [Pediatrics 2002, 108:223]**
- **Stop acyclovir if HSV cultures negative 48 hours in disease that's only suspected**
- **Known 2^{o} maternal lesions may merit cultures but not knee-jerk empiric treatment for 14 days**