**OSS 11.1 Reproductive Health: Pregnancy and heat stress (adverse outcomes)**

**Authors:**

*Valentina Sedlacek, University of Rochester School of Medicine & Dentistry*

*Ellen Townley, Creighton University School of Medicine*

*Caroline Muraida, Stanford School of Medicine*

***Faculty Advisor:***

*Marya G. Zlatnik MD, MMS, University of California San Francisco Obstetrics and Gynecology*

***Reviewer:***

*Blair Wylie, MD MPH, Professor of Obstetrics and Gynecology, Columbia University Vagelos College of Physicians and Surgeons.*

# **Goal:**

Understand that increased heat is associated with higher rates of low birth weight, preterm births, and stillbirths.

# **Climate related learning objectives:**

1. Discuss the adverse pregnancy outcomes associated with extreme heat.
2. Explain the mechanism of the effects of heat stress on pregnancy.
3. Discuss strategies to mitigate the adverse effects of heat stress on pregnancy outcomes.

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# **Clinical Vignette**

*Elena Navarro (she/her/ella) is a 31-year-old female who presents to the labor deck triage for severe abdominal pain. As the medical student on labor and delivery during your obstetrics and gynecology rotation, you enter the room to take a history.*

*Ms. Navarro is by herself; she says her brother is at home taking care of her other kids. She says that when she was leaving work today and going to pick up her kids from daycare, she started to have episodes of intense pain in her lower back and pressure in her pelvis. The episodes would last for a few minutes and then subside. She came directly to the hospital because she felt like these episodes of pain were just like when she had contractions with her previous pregnancies.*

*You ask her more about her current pregnancy. She is at 32w3d based on her first trimester ultrasound. She has had regular prenatal care without issues or complications.*

# **Patient Review of Systems**

*Ms. Navarro reports swelling in her feet, shortness of breath, fatigue, nausea, and low back pains. She also reports she has been more dizzy lately with the heat. She denies chest pain, fevers, chills, recent falls, loss of consciousness, emesis.*

# **Medical History**

*She denies a history of diabetes mellitus, hypertension, thyroid disorder, or bleeding disorder.*

*She has a history of GERD that is managed with Tums*

*Appendix removed at age 15*

***Obstetric history***

*- G4P2012*

*- G1, spontaneous vaginal delivery at 40w1d, living*

*- G2, spontaneous vaginal delivery at 39w3d, living*

*- One prior miscarriage*

# **Social and Environmental History**

*Ms. Navarro is an elementary school teacher in Seattle, Washington. She lives at home with her two children and is close with her family. She lives on the first floor of a small house she shares with her brother and his family. She says they don’t have any air conditioning.*

# **Family History**

*Her sister was recently diagnosed with PCOS, and her grandmother died of breast cancer at age 68. Her father has heart disease and hypertension. Her sister has never been pregnant.*

# **Physical Exam**

Temp: 37.3 BP: 119/68 Pulse: *84 Resp* Rate: *19* BMI: *29*

General: Ill and anxious-appearing female. Sitting in bed clutching the side rails of the bed, diaphoretic.

Head & Neck exam: Conjunctiva clear. Mucus membranes are dry. No JVD or lymphadenopathy.

Pulmonary: Clear to auscultation bilaterally, shallow breathing.

Cardiology: Normal rate, regular rhythm. Normal S1, S2. No murmurs, rubs, or gallops.

Abdomen: Soft, non-tender to palpation. Fundal height at 32 cm.

Extremities: Warm, moist, 1+ pitting bilateral pedal edema.

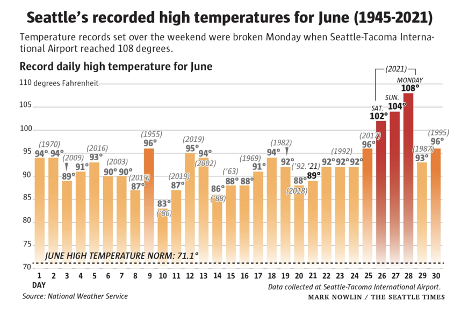
Sterile Vaginal exam: 5/0.5/+1 (5 cm dilated, length 0.5 cm, station +⅕), bulging membranes

Fetal heart rate tracing is reassuring but shows contractions every 3 minutes.:

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She reports her contractions are more painful, and her labor appears to be progressing. A bedside ultrasound shows the baby to be in a footling breech position. The attending on call recommends urgent c-section delivery. A vigorous preterm infant is born and taken to the special care nursery by the pediatricians.

# **The next morning, you walk into Ms. Navarro’s room while pre-rounding. Her family must have come to visit last night because she has balloons, cards, clothes from home, and a sweet homemade blanket for the baby. Ms. Navarro puts down her phone and a graphic from the Seattle Times article that she was reading catches your eye. She tells you she had trouble sleeping last night. She has been preoccupied, wondering why she delivered early. She asks, “What did I do differently this time?” You validate her concerns and assure her that you’ll thoroughly consider her questions and get back to her later. Before leaving, you inspect her cesarean incision site, gently palpating her abdomen. You ask if she has voided, eaten, or walked around yet.**

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Source:<https://www.seattletimes.com/seattle-news/weather/pacific-northwests-record-smashing-heat-wave-primes-wildfire-buckles-roads-health-toll-not-yet-known/>

On rounds, you bring up Ms. Navarro’s concern. Your attending asks you for your thoughts. You think back to the article headline you saw on the Seattle Times print Ms. Navarro had in her hands. You ask her, “Is there an association between extreme heat and preterm birth?”

You enter Ms. Navarro’s room and share that your team thinks that the extreme heat she’s been experiencing may have played a role in the preterm delivery. You confirm that she does not have access to air conditioning. She states that she doesn’t have air conditioning in her classroom nor at home, and that she has been extremely hot, sweating throughout the day.

Ms. Navarro asks additional questions regarding other effects of extreme heat on pregnancy. She says her brother’s wife is hoping to get pregnant soon and she wants to be able to share with them some of the consequences of heat stress on pregnancy, so that they can be prepared.

Ms. Navarro recovers well from her cesarean delivery and is discharged on postoperative day #3. Her baby will have to stay in the NICU for feeding and growing for a few more days, at least. She expresses her concerns about having to balance work, her kids at home, caring for her new baby in the hospital, and the cost of the baby’s stay in the NICU. You validate her feelings and ask the NICU social worker to meet with her to discuss possible resources.

**Mini Case**

*El*ena Navarro is a 31-year-old female, G4P2012, with a past medical history of GERD and appendectomy who presents in labor at 32w3d. She has had an uncomplicated pregnancy with regular prenatal care. Her contractions began this afternoon and now occur every 5 minutes. She denies loss of fluid or vaginal bleeding. She endorses swelling in her feet, shortness of breath, fatigue, and low back pains. She also reports she has been dizzier lately with the extreme heat wave. She denies chest pain, fevers, recent falls, loss of consciousness, emesis. Vitals are Temp 37.3, BP 119/68, HR 84, RR 19, BMI 29. Physical exam is notable for dry mucous membranes, shallow breathing, 1+ pitting bilateral pedal edema, Fundal height at 32 cm. The fetal heart rate tracing is overall reassuring, but the fetus is in footling breech presentation and labor is progressing. The baby is delivered by cesarean section. Postpartum, the mother asks about the cause of her preterm delivery. You review her history and learn that the patient is an elementary school teacher in Seattle, Washington. She lives at home with her two kids. She says they don’t have any air conditioning in the home or at the school where she works. Temperatures have been over 100 degrees F for the last 3 days.

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