

Problem Based Learning Exercise
“Melissa”
Clinical Case

Scenario Part 1

A 29 year old Caucasian female presents in the first trimester of her third pregnancy. Melissa comments that she is nervous about the pregnancy because her first resulted in miscarriage, and her son from her second pregnancy was born with spina bifida.

Tasks

1. What are your initial hypotheses as to the cause of the previous miscarriage and spina bifida in her son?
2. Develop a rationale to explain each.
3. What additional information is needed to confirm or disprove each hypothesis?
4. Explain your reasoning.
5. What diagnostic tools or tests (if any) are necessary?
6. Explain your reasoning.

Scenario Part 2

A comprehensive review of Melissa’s medical history revealed the usual childhood illnesses and a sports injury involving torn ankle ligaments in high school. The history was otherwise unremarkable. Her former obstetrician was contacted to forward her medical records.

The physical exam revealed a gravid uterus and was otherwise normal.

Melissa denied knowing of any immediate or extended family members with genetic defects or signs of mental impairment. She did remember hearing that a maternal aunt had a miscarriage many years ago.

When questioned further about eating habits, Melissa stated that she ate fresh fruits and vegetables, drank four glasses of milk each day and although she didn’t care for red meat, she did get plenty of protein from poultry and fresh fish.

When questioned about her living environment, she responded that the family built a home in an upscale suburban neighborhood three years ago. City water and sewage serve the area.

Laboratory Testing Results		
Test	Results	Reference
Hemoglobin	13.2 g/dL	12.8-14.2 g/dL
Hematocrit	39%	38-42%
Blood Type	A Rh positive	N/A
Antibody Screen	Negative	N/A
Serum Folate	8.3 ng/dL	2.9-15.6 ng/mL

Tasks

1. Does this new information reprioritize your initial hypotheses?
2. What additional information is needed?
3. Explain your reasoning.

Scenario Part 3

When questioned about the type of fish she ate, Melissa responded that she liked fresh water bass, sea bass, shark and swordfish, which she ate two to three times per week. The fish were always caught by her husband and uncle in local lakes or at deep sea fishing excursions.

Tasks

1. Does this new information change your hypothesis?
2. What additional information is needed?
3. Explain your reasoning.

Scenario Part 4

Heavy Metals Profile, Blood		
Test	Result	Reference
Arsenic	4.5 µg/dL	0.0-62.0 µg/dL
Lead	5.2 µg/dL	0.0-9.9 µg/dL (0-14 yrs) 0.0-24.9 µg/dL (> 15 yrs.)
Mercury	216 µg/dL	3-5 µg/dL

Tasks

1. What treatment (if any) is needed?
2. What recommendations would you make to keep this problem from reoccurring?
3. What follow-up (if any) is indicated?

Problem Based Learning Exercise
“Melissa”
Generalist Case

Scenario Part 1

A 29 year old Caucasian female presents in the first trimester of her third pregnancy. Melissa comments that she is nervous about the pregnancy because her first resulted in miscarriage, and her son from her second pregnancy was born with spina bifida.

Tasks

1. What are your initial hypotheses as to the cause of the previous miscarriage and spina bifida in her son?
2. Develop a rationale to explain each.
3. What additional information is needed to confirm or disprove each hypothesis?
4. Explain your reasoning.
5. What environmental issues might be involved?

Scenario Part 2

Melissa's medical history was unremarkable. Her physical exam and laboratory results were all within normal limits. Serum folate levels were adequate. Her former obstetrician was contacted to forward her medical records.

When questioned further about eating habits, Melissa stated that she ate fresh fruit and vegetables, drank four glasses of milk each day and although she didn't care for red meat, she did get plenty of protein from poultry and fresh fish.

When questioned about her living environment, she responded that the family built a home in an upscale suburban neighborhood three years ago. City water and sewage serve the area.

Tasks

1. Does this new information reprioritize your initial hypotheses?
2. What additional information is needed?
3. Explain your reasoning.
4. How might you identify the specific environmental threats to health?

Scenario Part 3

When questioned about the type of fish she ate, Melissa responded that she liked fresh water bass, sea bass, shark and swordfish, which she ate two to three times per week. The fish were always caught by her husband and uncle in local lakes or at deep sea fishing excursions.

Tasks

1. Does this new information change your hypothesis?
2. What additional information is needed?
3. Explain your reasoning.

Scenario Part 4

Heavy Metals Profile, Blood		
Test	Result	Reference
Arsenic	4.5 µg/dL	0.0-62.0 µg/dL
Lead	5.2 µg/dL	0.0-9.9 µg/dL (0-14 yrs) 0.0-24.9 µg/dL (> 15 yrs.)
Mercury	216 µg/dL	3-5 µg/dL

Tasks

1. What treatment (if any) is needed?
2. What recommendations would you make to keep this problem from reoccurring?
3. What follow-up (if any) is indicated?

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