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| **Maryland Next Gen NCLEX Test Bank Project**  **September 1, 2022; Update May 16, 2023** | | | |
| **Case Study Topic**:  (& standalone bowtie) | Post-Strep Glomerulonephritis  (pediatric) | **Author:** | Heidi Bresee, DNP, PPCNP-BC, RN  Frederick Community College |

**Case Summary**

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| Six-year-old male child presents to the emergency department with a 24-hour history of fatigue, poor appetite, tea-colored urine, oliguria, mild hypertension, and facial swelling after completing treatment for strep throat. The child is diagnosed with poststreptococcal glomerulonephritis (PSGN) and is admitted for treatment. |

**Objectives**

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| 1. Review how to evaluate a patient for poststreptococcal glomerulonephritis  2. Summarize the treatment and management options available for poststreptococcal glomerulonephritis  3. Plan care of child with poststreptococcal glomerulonephritis  4. Educate the child and family about diagnosis and treatment plan  5.Comprehend reasons for monitoring during treatment  6. Explain interprofessional team strategies for improving care coordination and communication to improve outcomes for patients affected by poststreptococcal glomerulonephritis |

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| **Case Study Link** | **Case Study QR Code** |
| <https://umaryland.az1.qualtrics.com/jfe/form/SV_8cQvohVkmgfi6Wy> |  |
| **Bow-tie QR Code** | **Bow-tie Link** |
|  | <https://umaryland.az1.qualtrics.com/jfe/form/SV_cMC6Er1EvqR3G3c> |

**References**

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| 1. Marcdante, K., Kliegman, R. (2019). *Nelson essentials of pediatrics*, 8th ed. ,Elsevier, Inc. 2. Ricci, S., Kyle, T., Carman, S. (2021). *Maternity and pediatric nursing,* 4th ed., Wolters Kluwer. 3. Rudd, K., Kocisko, D. (Ed.) (2019). *Pediatric nursing: The critical components of nursing care,* 2nd ed. F. A. Davis. |

**Case Study Question 1 of 6**

The parent brings a 6-year-old male child to the emergency department with new symptoms after completing treatment for strep throat.

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| **Nurses’ Notes** |
| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improved. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn. | |

* Drag the 4 findings are most significant to the box on the right.

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| Client Findings | Top 4 Findings |
| Blood pressure\* |  |
| Periorbital edema\* |  |
| Poor appetite |  |
| Headache |  |
| Fatigue |  |
| Urine output\* |  |
| Increased intake of fluids |  |
| History of strep throat\* |  |

**Scoring Rule: 0/1**

**Rationale:** The blood pressure for an 8 year-old should be less than 120/80. The history of recent strep throat, blood pressure, periorbital edema and changes in urine output are the most significant findings because they suggest the child has poststreptococcal glomerulonephritis. The child is at risk for heart failure, seizures, and encephalopathy due to hypertension and fluid overload as evidenced by bilateral periorbital edema, decreased urine output, hematuria, and high blood pressure of 128/80.

**Case Study Question 2 of 6**

The parent brings a 6-year-old male child to the emergency department with new symptoms after completing treatment for strep throat.

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| **Nurses’ Notes** |
| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improved. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn | |

The nurse suspects poststreptococcal glomerulonephritis and considers the child’s risks.

* Which of the following complications is the client at risk for experiencing? Select all that apply
* Bowel obstruction
* Heart failure\*
* Diabetes
* Liver failure
* Fluid overload\*
* Acute renal failure\*
* Adrenal insufficiency
* Hypertension\*

**Scoring Rule: +/-**

Rationale: The child is at risk for fluid overload leading to hypertension and cardio- pulmonary congestion leading to heart failure. Untreated the decreased urine output, hematuria, and high blood pressure can lead to renal failure. Gastrointestinal, endocrine, and hepatic complications are not known ramifications of poststreptococcal glomerulonephritis.

**Case Study Question 3 of 6**

The parent brings a 6-year-old male child to the emergency department with new symptoms after completing treatment for strep throat.

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| **Nurses’ Notes** |
| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improvement. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn.  0845: Provider updated on lab results and orders the client to be admitted to the pediatric unit with  poststreptococcal glomerulonephritis. | | | | |
| **Laboratory Report** | |
| Lab | | | Results | Reference range | |
| BUN | | | 23 | 10-20 mg/dL | |
| Creatine (Serum) | | | 1.7 | 0.9 to 1.4 mg/dL | |
| WBC | | | 16.5 | 4.5 – 10.5 x 103 cells/mm3 | |
| Potassium (serum) | | | 5.5 | 3.5 to 5 mEq/L | |
| Sodium (serum) | | | 142 | 135 to 145 mEq/L | |
| Anti-streptolysin O titer | | | 288 | <200 IU/mL | |
| Erythrocyte sedimentation rate (ESR) | | | 48 | 0-10 mm/hr | |

Labs return and the child receives the diagnosis of poststreptococcal glomerulonephritis.

* Complete the sentence from the list of drop-down options.

|  |  |
| --- | --- |
| The problem the nurse needs to address first is | treating the infection  lowering the blood pressure  managing the fluid overload |

**Scoring Rule: 0/1**

**Rationale:** The top priority is to manage the fluid overload. Managing the overload will help the blood pressure. The nurse will anticipate orders to treat the infection, however the problem is being caused by an immune response not an infection.

**Case Study Question 4 of 6**

The parent brings a 6-year-old male child brought to the emergency department with new symptoms after completing treatment for strep throat.

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| **Nurses’ Notes** |
| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improvement. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn.  0845: Provider updated on lab results and orders the client to be admitted to the pediatric unit with  poststreptococcal glomerulonephritis. | | | | |
| **Laboratory Report** | |
| Lab | | | Results | Reference range | |
| BUN | | | 23 | 10-20 mg/dL | |
| Creatine (Serum) | | | 1.7 | 0.9 to 1.4 mg/dL | |
| WBC | | | 16.5 | 4.5 – 10.5 x 103 cells/mm3 | |
| Potassium (serum) | | | 5.5 | 3.5 to 5 mEq/L | |
| Sodium (serum) | | | 142 | 135 to 145 mEq/L | |
| Anti-streptolysin O titer | | | 288 | <200 IU/mL | |
| Erythrocyte sedimentation rate (ESR) | | | 48 | 0-10 mm/hr | |

The nurse on the pediatric unit anticipates admitting the client.

* Select the orders from each of the categories the nurse should anticipate including in the plan of care. Each category may have more than one order.

|  |  |
| --- | --- |
| Categories | Orders |
| Medications | * Ampicillin\* |
| * Furosemide\* |
| * Dexamethasone |
| * Phenobarbital |
| Nursing | * Strict I&O\* |
| * Diet restrictions\* |
| * IV fluids at maintenance rate |
| * Neuro checks Q 6 hours\* |

**Scoring Rule: +/-**

**Rationale:** The child is experiencing poststreptococcal glomerulonephritis. Treatment will include antibiotics for positive Group A streptococcal infection and diuretic therapy for fluid overload and hypertension. Antihypertensives will be added as needed. Other treatment will include strict I&O, sodium and fluid restrictions, and neuro checks every 6 hours due to risk of development of seizures and encephalopathy.

**Case Study Question 5 of 6**

Six-year-old male with poststreptococcal glomerulonephritis is admitted to the pediatric unit.

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| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improvement. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn.  0845: Provider updated on lab results and orders the client to be admitted to the pediatric unit with  poststreptococcal glomerulonephritis.  0900: Transferred to the pediatric unit. Vital signs: T-99 F (37.2C), HR 110, RR 24, B/P 128/84, pulse oximeter 99% on RA. Mild headache 2/10. Weight 42 lbs (19kg) | | | | |
| **Laboratory Report** |
| Lab | | | Results | Reference range | |
| BUN | | | 23 | 10-20 mg/dL | |
| Creatine (Serum) | | | 1.7 | 0.9 to 1.4 mg/dL | |
| WBC | | | 16.5 | 4.5 – 10.5 x 103 cells/mm3 | |
| Potassium (serum) | | | 5.5 | 3.5 to 5 mEq/L | |
| Sodium (serum) | | | 142 | 135 to 145 mEq/L | |
| Anti-streptolysin O titer | | | 288 | <200 IU/mL | |
| Erythrocyte sedimentation rate (ESR) | | | 48 | 0-10 mm/hr | |
| **Orders** |
| Medications | | * Amoxicillin/Clavulanic acid 250mg PO twice a day | | |
| * Furosemide 20mg slow IVP now | | |
| * Acetaminophen 360mg PO every 4hours PRN pain | | |
| Nursing | | * Strict I&O | | |
| * Diet: Low sodium (2g) with 1 liter fluid restriction | | |
| * Bed rest | | |
| * Vital signs @ 2hrs & Neuro checks Q 6 hours | | |
| Radiology | | * Renal sonogram * Chest Xray | | |

The nurse plans the family teaching about the treatment plan.

* For each teaching point, click to specify if the nurse should address the teaching immediately upon admission, within the next hour, or before the end of the shift.

|  |  |  |  |
| --- | --- | --- | --- |
| Order | Immediately | Within the next hour | Before the end of the shift |
| Importance of fluid restriction | * \* |  |  |
| Information on medication administration and side effects |  | * \* |  |
| How to monitor urine output and color |  |  | * \* |
| Avoid participation in strenuous activity |  |  | * \* |
| Signs and symptoms of seizure activity and changes in LOC | * \* |  |  |
| Sodium restricted diet planning |  | * \* |  |
| Bedrest orders | * \* |  |  |
| Explanation of diagnostic tests ordered | * \* |  |  |

**Scoring Rule: 0/1**

**Rationale:** When teaching is complex, teaching should be broken down into short segments. Upon admission the things that are most important for the nurse to address before leaving the client alone are the bedrest and fluid restriction orders, signs and symptoms to call the nurse for (in this case seizures or changes in LOC) and diagnostic test that are ordered so the client will not be surprised if another team member comes into the room. Medication teaching should be done when the medicine is given. Diet teaching will need to be done before lunch. Since the client is on bedrest discussions of strenuous activities can occur later. Discussions of monitoring urine output can occur when the child needs to void.

**Case Study Question 6 of 6**

Six-year-old male with poststreptococcal glomerulonephritis is admitted to the pediatric unit.

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| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improvement. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn.  0845: Provider updated on lab results and orders the client to be admitted to the pediatric unit with  poststreptococcal glomerulonephritis.  0900: Transferred to the pediatric unit. Vital signs: T-99 F (37.2C), HR 110, RR 24, B/P 128/84, pulse oximeter 99% on RA. Mild headache 2/10. Weight 42 lbs (19kg) | | | | |
| **Laboratory Report** |
| Lab | | | Results | Reference range | |
| BUN | | | 23 | 10-20 mg/dL | |
| Creatine (Serum) | | | 1.7 | 0.9 to 1.4 mg/dL | |
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| Anti-streptolysin O titer | | | 288 | <200 IU/mL | |
| Erythrocyte sedimentation rate (ESR) | | | 48 | 0-10 mm/hr | |
| **Orders** |
| Medications | | * Amoxicillin/Clavulanic acid 250mg PO twice a day | | |
| * Furosemide 20mg slow IVP now | | |
| * Acetaminophen 360mg PO every 4hours PRN pain | | |
| Nursing | | * Strict I&O | | |
| * Diet: Low sodium (2g) with 1 liter fluid restriction | | |
| * Bed rest | | |
| * Vital signs @ 2hrs & Neuro checks Q 6 hours | | |
| Radiology | | * Renal sonogram * Chest Xray | | |

The nurse evaluates the family’s understanding of the treatment plan.

* For each client statement, click to specify whether the statement indicates an understanding, or no understanding of teaching provided.

|  |  |  |
| --- | --- | --- |
| Statement | Understanding | No understanding |
| “Due to the dark colored urine, my child needs to drink a lot of water to help the kidneys.” |  | * \* |
| “My child can return to baseball practice when he gets discharged tomorrow.” |  | * \* |
| “My child will have long-term kidney problems from this illness.” |  | * \* |
| “My child needs close monitoring for seizure activity until he is better.” | * \* |  |

**Scoring Rule: 0/1**

**Rationale:** The child is experiencing poststreptococcal glomerulonephritis. The child is at risk for seizures and encephalopathy. The parent must understand the importance of close monitoring for changes in LOC or seizure activity and when to seek additional medical attention.

**Bowtie**

The parent brings a 6-year-old male child to the emergency department with new symptoms after completing treatment for strep throat.

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| **Nurses’ Notes** |
| 0800: Parents report the child developed fatigue, loss of appetite, and a headache yesterday. Today they noticed the child’s face was swollen, and his urine output was decreased. History includes recently completing 8 days of amoxicillin for strep throat but ended treatment 2 days early when symptoms improved. Child was previously healthy, taking only multivitamins daily. Parent tried having the child increase his intake of fluids, but the output did not change, and his urine is now tea-colored. Vital signs: T-98.2 F (36.78C), HR 110, RR 22, B/P 128/80, pulse oximeter 99% on RA, pain scale of “3.” Periorbital edema present. Child placed in treatment room. Connected to cardiac and pulse oximeter monitor. Labs drawn | | | | |
| **Laboratory Report** | |
| **Lab** | | | Results | Reference range | |
| BUN | | | 23 | 10-20 mg/dL | |
| Creatine (Serum) | | | 1.7 | 0.9 to 1.4 mg/dL | |
| WBC | | | 16.5 | 4.5 – 10.5 x 103 cells/mm3 | |
| Potassium (serum) | | | 5.3 | 3.5 to 5 mEq/L | |
| Sodium (serum) | | | 142 | 135 to 145 mEq/L | |
| Anti-streptolysin O titer | | | 288 | <200 IU/mL | |
| Erythrocyte sedimentation rate (ESR) | | | 48 | 0-10 mm/hr | |
| Albumin | | | 3.5 | 3.4 to 5.4 g/dL | |

* Complete the diagram by dragging from the choices below to specify what condition the client is most likely experiencing, 2 actions the nurse should take to address that condition, and 2 parameters the nurse should monitor to assess the client’s progress.

|  |  |  |
| --- | --- | --- |
| Action to take |  | Parameter to monitor |
|  | Condition most likely experiencing |  |
| Action to take |  | Parameter to monitor |
|  |  |  |
| **Actions to take** | **Potential conditions** | **Parameters to monitor** |
| Administer diuretics\* | Acute renal failure | Blood pressure\* |
| Arrange peritoneal dialysis | Nephrotic syndrome | Potassium levels |
| Administer antibiotics\* | Poststreptococcal glomerulonephritis\* | Urine characteristics \* |
| Infuse albumin | Pyelonephritis | Temperature |
| Administer corticosteroids |  | WBC |

**Scoring Rule: 0/1**

**Rationale:** The child is most likely experiencing poststreptococcal glomerulonephritis (PSGN) based on the history, reported urine characteristics, elevated blood pressure, periorbital edema, the elevated WBC, and the anti-streptolysin O titer. Serum albumin levels would be low with nephrotic syndrome. High fever, flank pain, and foul smelling urine would be expected with pyelonephritis. The creatine and BUN are not elevated enough to indicate acute renal failure. Treatment for PSGN includes treating the strep infection, giving diuretics, restricting fluids and if needed giving antihypertensives. Dialysis may be needed but that would not occur before trying other measures. The best indicators of treatment effectiveness are improved urine output and color and resolution of the hypertension.