Nursing Management of Patient with Neurocysticercosis

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Neurocysticercosis is the most common parasitic diseases affecting the CNS. It is the lead cause of adult onset of seizure worldwide.

Case Study

Venkataramana, 39 years, was admitted to Hospital with history of 2 episodes of seizures and complaints of headache and vomiting for one week. C. T. Scan showed hyper dense clarified lesion and MRI shows iso hypointense lesion with oedema. Diagnosis was Ventricular Neurocysticercosis.

Neurocysticercosis is systemic infection produced by the encysted larval form of the Taenia solium tapeworm and is the most common parasitic diseases affecting the CNS.

Etiology

The disease is caused by ingestion of water or food (vegetables, raw or uncooked pork) contaminated with the Taenia solium tapeworm. Food may be contaminated if washed with contaminated water or grown in areas that use human faeces as fertilizer.

Pathophysiology

Infection is caused by ingestion of food or water contaminated with tapeworm egg. After ingestion the egg hatch within the G.I. tract and the parasites penetrate the bowel wall and enter the blood stream. The organism thus migrate into host tissue such as heart, skeletal muscle CNS structures- CNS infection includes invasion in to brain parenchyma, ventricle or subarachnoid space.

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Signs and Symptoms

Clinical symptoms depend on the stage of the cyst and the location in the CNS

Subjective data:

a. Unilateral or bilateral headache
b. Nausea
c. Fatigue
d. Blurred vision or dizziness due to increased ICP Secondary to hydrocephalus

Objective data:

I. Generalized signs and symptoms - weight loss abdominal pain and diarrhoea

II. Neurological signs

a. Seizures
b. Cranial nerve abnormalities
c. Focal neurological deficit
d. Nuchal rigidity
e. Altered mental status or increased I C P
f. Radiculopathy or myelopahty if cyst is located in the spine.

III. Hydrocephalus:

Due to obstruction of ventricles by a cyst or decreased absorption of CSF due to the dying cyst in ventricular system. It may become chronic after cyst calcifies.

Diagnostics

Medical History : Explore travel history to endemic areas contact with immigrants or persons who travel extensively.

Physical Examination : If the eyes are involved parasites may be seen directly in fundoscopic examination.

Lab Studies:

1. Culture : Stool specimen to identify tapeworm and sources of infection only.
2. C S F Studies: Increased protein level, decreased glucose level
3. Serology :

a) Enzyme linked immuno electro transfer blot assay (E I T B)
b) ELISA Most widely used, is less expensive and more sensitive on C S F than E I T B.

Imaging Studies:

i. C T - Normal in early stages. Reveal contract enhancement as cyst dies, calcification seen clearly.
ii. MRI - may be normal in early stages, best for location cyst in ventricles which may float and change location.
iii. Radiography - Demonstrates calcification

Treatment

A. Antiparasitic agent – These drugs are cysticidal and cause the cyst to begin dying within 2 –5 days-. Patients with hydrocephalus should undergo surgery for ventricular peritoneal shunt insertion prior to antiparasitic therapy.

1. Albendazole is the drug of choice and is reported to destroy 75% to 99% of parenchymal cysts. Albendazole is more effective than praziquantel against meningeal and ventricular cysticerosis. It does not interact with anticonvulsant.

2. Praziquantel : Serum levels are decreased by carbamazepine, phenytoin and dexamethazone, serum levels are increased by cimetidine. Antiparasitic agents should not be used in patients who present with cysticercotic encephalitis.

B. Cortico steroids: When a cyst begins to die, the immune systems react, which cause an inflammatory response that leads to exacerbation of symptoms, steroids are usually given along with antiparasitics to reduce the inflammation.

C. Anticonvulsants: Seizures are the most common symptom and occur when the cyst invades the parenchyma.

Surgical

Removal or drainage of parenchymal lesion is not typically performed unless the cyst is very large causing increased I C P that is not responding to medication or the procedure is required for diagnostic purpose because laboratory tests are inconclusive.

A ventricular peritoneal shunt may be inserted for hydrocephalus. Endoscopic removal of the cyst can be done.

Venkataramana was treated with Rantac 150 mg. BD, Eptoin 100 mg. Tid, Wysolone 5 mg. Tid, Albendazole 400mg. Tid for 2 weeks, and then BD for 2 weeks. Then endoscopic removal of the cyst was done. After the surgery patient was treated with Ampicillin 500 mg. 6 hrly, Rantac 150. BD

Potential Complications

1) Shunt malfunction
2) Seizures

Nursing care

1. Hyperthermia related to effect of inflammation and increased I C P in the hypothalamus secondary t CNS infection.

Nursing interventions

* Administer antipyretic drugs
* Institute cooling measure such a Tepid sponging
* Monitor vital sign and level of consciousness
* Monitor W B C count and electrolyte levels
* Administer I / V fluids as ordered. Monitor intake and output closely.

II. Acute pain related to inflammation of meninges and increased I C P secondary to CNS inflammation

Nursing interventions

* Assess the location, quality and severity of pain and have patient rate pain using 1 to 10 scale or visual analog chart.
* Assess the patient's behaviour and physiological sign secondary to pain.
* Provide quiet darkened room with minimal disturbance
* Implement comfort measures to promote relaxation eg. Reposition, elevate the head of the bed apply a cool compress to head.
* Initiate non-pharmacological measures for pain control including transcutaneous electrical stimulation, acupuncture, heat, music, relaxation technique.
* Administer analgesics as prescribed.
* Assess patient's pain, effectiveness of intervention as well as side effect.
* Administer pain medication prior to activities.

III) Risk for injury related to seizure activity secondary to cerebral irritation.

Nursing interventions

* Implement seizure precaution - plan bed in low position with side rails up and padded, keep suction and oral airway available at bed side.
* During a seizure
- Protect patient from injury and place patient on his or her side
- Maintain a patient airway, loosen clothing around neck.
- Do not put anything in patient's mouth.
* Document seizure activity, length of time, description of seizure and postictal characteristics.
* Monitor neurological status and vital signs after the seizure.
* Administer prophylatic A E D..

IV. Increased I C P related to CNS infection

Nursing interventions

* Monitor neurological and vital sign closely.
* Elevate head of the bed 30 degrees with head in alignment to promote adequate various drainage.
* Suction as needed, avoid aggressive suctioning and tight endotracheal tapes.
* Monitor I C P and E V D closely, records reading and drainage.
* Maintain Normal electrolytes
* Administer stool softners to avoid valsalva manoeuvre

V. Hydrocephalus related to cysticercosis

Nursing interventions

* Monitor neurological status and vital sign closely
* Maintain E V D and record drainage
* Provide post operative care for patient with a ventricular shunt
* Monitor for signs of shunt malfunction

Conclusion

Mr. Venkataramana was nursed in the Pre and Post Operative Neurosurgery Ward where he could be watched carefully. A cot with railing has been allotted to avoid injuries and was given treatment with aseptic precautions.

Nursing alertness in observation prevented secondary infection and complications. After the surgery symptoms reduced markedly. By eighth day after surgery he got discharged from the Hospital.

References:

1. Bader and Little Johns (2004) – A A N N core curriculum for Neuroscience Nursing 4th Edition – Saunders Chapter 18 Page 524-628, 664-667.

2. Black, Hawles, Keene - Medical Surgical Nursing – 6th Edition – Sauders Volume 2 Chapter 69 Page 1948.

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