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REVIEW ARTICLE

Examining Strategies for Reduced Nervous System Infections without Surgery

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ABSTRACT
Infections of central nervous system (CNS) are among the most dangerous infectious diseases that account for significant percentage of all morbidity and fatality. The causes of these infections are viral, fungal, parasitic, protozoa and helminthes. These infections result in CNS illnesses characterized mainly by meningitis, neurological disorders and coma. In this regard, the research aims to examine strategies for reducer nervous system infections without surgery. The used method is descriptive prospective one and gathered data are analyzed by using software.
Keywords: *central nervous system, meningitis, viral infection, bacterial infection*

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INTRODUCTION

Nervous system contains a set of elements that can harmonizes a living being as well as internal systems of living being with environment. Therefore, any disorder in this system wills leadto imbalance or inconsistency of the entire body. [1]

Nervous system is anatomically divided into two parts: 1) central nervous system that includes brain and spinal cord. The structure consists of billions nervous system that undertakes the control and adjustment of all organs and body's members. Nervous cells from two groups of cells that are structurally fully distinct. 2) Peripheral nervous system includes nerve fibers outside of bone chambers that are connected with central masses such as nerve fiber related to spinal cord (modular nerve) and includes 31 couples of nerve, nerve fibers related to brain named brain nerve and include 12 couples of nerve. Of course, there are also ganglion and nerve fiber that have no direct connection with brain and spinal cord. [2]

Special features of nervous system are influence on external stimulus, generation of a nervous flow indicating the effect of stimulus, nervous flow conduction from one place to another part of system and finally transmission from one nerve unit to another.

The commonest consequence of the disease in Childs is fever along with symptoms of central nervous system. Infections may appear by bacteria, and viral, fungal and parasitic agents. Pathogens are affected by age, safety state of host and pathogen-agent epidemiology. Viral factors are the most important factors for CNS infections and bacterial, parasitic, and fungal infections also can influential. It is rarely seen that CNS infections are caused by Mycoplasma species and factors.

Patients afflicted with CNS infections often visit clinic for fever and consciousness disorder and are frequently characterized by greater white blood cell in spinal fluid, change of sugar and protein level. It is vital to rapidly detect disease and start proper treatment, so that delay may result in higher death toll and permanent complications for patients. due to unnecessary and improper diagnostic measures such as brain CT scan, in cases where no indications are seen, diagnosis delays leads to higher financial cost as well as Irreparable physical complications. [3]

This infections result in CNS diseases that mainly include meningitis, neurological disorders and coma. Since the beginning of viral epidemic of human immune system three decades age in Africa, significant variation has been observed in total pattern of CNS infections. Central nervous system opportunistic

infections pertinent to HIV virus are now widespread and are the main cause of death in adults in many countries. The main causes are cryptococcal meningitis (CM), cerebral toxoplasmosis (CT) and tuberculosis meningitis (TBM). At the same time cerebral malaria, acute bacterial meningitis (ABM), tetanus, trypanosomiasis, neurocysticercosis and brain abscess remain as major causes of neurological illnesses. [4]

Considering the objective of the study, infections which give rise to CNS disorder are numerous and used treatments are very different. In this regard, we investigate infections related to central nervous system and medicinal treatments.

TYPES OF CNS INFECTION

- Viral
- Bacterial
- Parenchyma
- Fungal

EXAMINING VIRAL INFECTIONS

The brain can be a simple target for viral infections. Actually, it is lack of Lymphatic system and only few numbers of immune system cells can migrates into brain parenchyma. Many viruses reproduce in CNS when they penetrate into the brain. Brain's infections and complications are commonly acute; however, these infections are usually slight in other organs.

Viruses are the smallest nucleic acid pieces covered by protein and lipoprotein. They need host for their reproduction. In terms of survival, virus maintains survival of cells before being a cell killer, meaning that continuous co-existence is required for permanent survival virus. Nevertheless, virus's ability for mutation sometimes cause fatal mutation that do not maintain balance condition with its host. [5]

As a photogenic agent, viruses have challenged human life for many years and huge amounts of expenses are still consumed for patient treatment, injuries resulting from loss of working hours, rehabilitation and maintenance of damaged patients across the world. In the meantime, CNS viral diseases and nervous tolls of viral infections also play a vital role, because efficient tools, knowledge, skill and enough medical instrument is needed for diagnosis, moreover, the treatment is very difficult because of special life of virus. Some examples of viral infections are mentioned below.

Parenchyma infections

Viruses are the leading cause of brain parenchyma. Of course, toxoplasmosis and tuberculosis are also the main cause of brain parenchyma infection.

Encephalitis

Encephalitisis caused by Herpes simplex infections that are one of the commonest causes of acute and viral infection for human CNS. The infection mainly takes place in people less than 18 years old. Encephalitis infection causes acute disease or morbidity in those who not being cured or for any reason didn't receive anti-viral treatment. Early diagnosis of the infection and treatment with Acyclovir is highly significant to reduce fatality and incidence of neurological toll in survivors. [6]

Treatment involves using proper and diagnosis-based medicine. Specialized anti-viral cure has to be started at a suitable time. Vital measures, such as blood pressure and respiration should be advocated and controlled constantly, if necessary. Many patients may require ICU care at early step of Encephalitis. Preliminary and supportive treatment must be followed by precise control of internal skull pressure, limited consumption of liquids and avoidance of using hypotonic solution or fever control. Convulsive attack should be cured by standard anti-convulsive regimes. Preventive treatment has to be taken into consideration with respect to higher incidence of convulsive attacks in severe Encephalitis cases. [7]

Investigating bacterial infection

Regarding conducted examination, some of the most important bacterial infections are: bacterial Meningitis and brain abscess in bacterial meningitis, the pia mater, cerebrospinal liquid that cause infection or inflammation, secretion of meningitis. The patient will experience ague and become faint or weak. Patients will complaint about headache, sleepiness and stiffness of neck. If infection becomes acute, it may lead to coma. If bacterial meningitis is not immediately cured, it will quickly change into dangerous state or can be lethal. Ordinary treatment is thoracic medicine with antibiotic that usually treat infection. However, neurological toll may remain. [8]

Generally, brain abscess is created by some bacteria, fungus and parasite that are separated from the initial place of infection. They have spread in other parts of body and have transmitted to brain through blood or tissue. At about 40% of cases, nose sinus, middle ear and mastoid cells are the primary origin of infection, and about 30% of cases, lung and cardio-vascular tissue are the origin for infection. Brain

abscess symptoms move more slowly than meningitis, but the signs are similar to each other. Ordinary treatment involves drying abscess through surgery combined by antibiotic medicinal therapy. Recovery rate is usually significant, although the patient may experience serious disorder that is associated with brain tissue sleepless.

Meningitis

Meningitis is defined as inflammation of the pia and arachnoid meninges and the cerebrospinal fluid. Meningitis has different types: acute meningitis (purulent): it is one the main cause of fatality and failure at all ages so all cases are created by bacteria.

Acute lymphatic meningitis (viral): it is often caused by virus and sometimes called acute aseptic meningitis.

Chronic meningitis: The most widespread cause is bacteria and fungus.

Viral and bacterial meningitis are the commonest infections of CNS that inflammation around spinal and brain membrane occur; therefore, arachnoid, the pia mater and cerebral spinal liquid are involved in the illness. [9]

There are two types of viral and bacterial meningitis that bacterial one is more lethal for children. Clinically, there are also two kinds of chronic and acute meningitis. The commonest symptoms include fever, restlessness and nausea. These symptoms are not typically considered by adults. [10]

Bacterial meningitis is very acute and it is more lethal than viral infections, and produces more disability even after post-treatment. In recent years, despite of advancement in producing anti biotic and medicine, 20% of afflicted with meningitis patients die. CNS viral infections are more common; however, there is no precise statistics of affected patients. [11]

Due to the difference at illness intensity and treatment, it is highly important to know the cause of meningitis caused by viral or bacterial factors. Generally, the intensity of meningitis caused by viral factors is less and may be cured without particular therapy. It is also important to know the type of bacteria when patient is affected by bacterial meningitis, because antibiotic can prevents spread of some factors among people. [12]

Pharmaceutical therapy:

Fast treatment with venous antibiotics is the first principle of meningitis treatment to prevent unpleasant tolls. Type of antibiotic is determined by looking at bacteria kind (cerebral spinal test can be used for detection). Of course, physician can uses antibiotics against many bacteria until test response is prepared, after preparing the response of cerebrospinal liquid, more special antibiotics is prescribed for patient. If herpes is the cause of viral meningitis, prescription of some anti-viral medicine is effective. [9]

Fungal infections:

Fungal damages are hardly seen in infectious diseases. Such infections are often seen in patients with immune system disability, diabetes, lymphoma, leukemia, anemic aplastic organ implant receiver and those who are subject to chemotherapy or receive steroid for longer time. Infection directly emitted from lung or other afflicted organs may reach to spinal column and at some cases, the original center is not known. [13]

Funguses that lead to CNS infections includes yeasts, fiber fungi and two shapes fungi. Meningitis and brain abscess with or without vessel invasion are the most important symptoms of CNS fungal contamination which cause hospitalization in special care unit. Due to non-specialized symptoms and lack of quick diagnosis tests, generally CNS fungal contaminations are not well diagnosed. [14]

CNS fungal infections are considered a diagnostic and therapeutic challenge. Many numbers of organ transplants, chemotherapy patients, hospitalization in acute care unit, immune system failure patient and blood malignant illnesses gives rise to fatality and morbidity.

Other factors prone to fungal infections are numerous surgeries on sinus, longer treatment with antibiotics, various immune system deficiency, diabetes ketoacidosis, etc. [15]

Pharmaceutical treatment:

The primary issue to successfully cure CNS fungal contamination involves maintenance higher indicator of clinical symptom, pathogen diagnosis through Anti gene, histology or fungal culture obtained by biopsy or lumber hole. Effective anti-fungus is limited to significant toxicity and consumer low dosage. In addition, patient with higher risk for fungal contamination is often various in other pharmaceutical prescription like retrovirus or immune suppressor which has several medicinal interaction and medicine. Moreover, Itraconazole, anti-fungus flu cytosine, posaconazole, voriconazole and anti-fungal amphotericin are used to cure CNS fungal infections.

Subdural and epidural infection

These two types of infections are rare but highly active. These damages are usually produced because of primary infection toll in paranazole sinus or mastoid or following trauma.

CAUSES OF INFECTION

Nervous system is not in direct contact with surrounding environment, except olfactory nerve. Viruses inter into the body and reach themselves to central nervous system in several ways. Simplex herpes virus mainly enters into the body through mucus and reproductive system. It has not been so far proven that primary infection has reached to central nervous system. During the primary viral infection, the host's normal defense system tries to constrain it; however, few numbers of viruses successfully reach themselves to CNS in two different ways.

RESEARCH METHOD

In this prospective descriptive research, patients afflicted with CNS infection and hospitalized in Imam Hospital were regularly examined and information compiled from questionnaire submitted to 108 patient's was analyzed by SPSS software and Kay test.

The research was examined at a certain interval. Finally, 108 received patients in emergency. Primary visit based on condition, physical examination diagnosis process began and regarding symptom flow, illness background, and legal or illegal consumer medicine and signs available at physical examination, differential diagnosis was raised for patient and necessary orders were requested. Some instructions were requested for patients such as record of some vital symptoms, primary tests and blood culture after visit, and the considered antibiotics prescribed.

Patients were sometimes referred to infectious service for visit during investigation or often after doing test. The considered data were entered in a questionnaire that compiled for this purpose. It is likely that patient's antibiotic be replaced by another during antibiotics step where change time, dosage appropriateness and type of antibiotics were examined based on final results and recorded in questionnaire form. Afterwards, findings of questionnaire were extracted and analyzed by using SPSS software, to determine how many percent of patients have been got over without surgery.

Generally, for patients hospitalized due to CNS infection with some symptoms like headache and loss of consciousness, hallucination and other questionable signs to meningoencephalitis, empirical antibiotic includes Ceftriaxone,Vancomycin. Acyclovir and Ampicillin is also added to this medication in case of higher age or immune system deficiency, to adjust patient's antibiotics after doing brain imaging and lumber puncture or appearance of CSF Analysis, rejection or affirmation of CNS infection.

RESULTS

The following findings were obtained by investigating registered data. Patient's age average was 46/6. A total of patients, 68 patients were male and 40 was female. In this respect, out of 108 patients, 38 cases (35%) were prescribed proper antibiotics with correct antibiotics and at a suitable time. And 70 patients (65%) hadn't received proper antibiotics with suitable dosage. The result of CSF analysis along with receiving proper dosage of antibiotics determined that only 40% of patients had unnatural analysis. Finally, with regard to the above findings, a total of 35% patients who received proper antibiotics with suitable dosage quickly attain recovery.

CONCLUSION

CNS infections are considered one of problems that impose numerous economic and human damages to country's therapeutic sector. As mentioned before, nervous system can be affected by many bacteria and viruses, so regarding a variety of studied infections, there are various treatment for these types of infections which we examined the effect of medicinal treatment on these infections and we lastly found that antibiotics can prevent expansion of some infections among people.

REFERENCES

1. Goldacre MJ, Wotton CJ, Seagroatt V, et al. (2004) Multiple sclerosis after infectious mononucleosis: record linkage study. J Epidemiol Community Health; 58: 1032
2. Allen NJ, Barres BA (2009) Neuroscience: Glia – More Than Just Brain Glue, Nature; 457: 675-677
3. Bell DJ, Sukling R, Rothburn MM, Blanchard T, Stoeter D. (2009) Management of suspected herpes simplex virus encephalitis in adults in a UK teaching hospital. Clin Med; 9:231-235
4. Jackson, A, Hosseinipour, MC (2010) Management of Cryptococci meningitis in sub-Saharan Africa. Curr HIV/AIDS Rep. Aug; 7(3):134-42.
5. Iravani, S. (2012) Investigating the transmission of viral infection from aquatic beings to human as a dangerous factor for food safety, research scientific journal of medical science university.
6. Kimberlin, D. (2004) Herpes simplex virus, meningitis and encephalitis in neonates. Herpes; 11 (2): 65-76.
7. Molavi, P., Kolarastaghi, A. R., Hakimi, J., Mohamadpour, S., Khodavesi, S. (2011) CNS fungal contamination, the quarterly research, the fourteenth year. NO 47

8. Ozden, M, Kalkan, A, Demirdag K, Denk A, Kilic SS (2004). Hepatocyte growth factor (HGF) in patients with hepatitis B and meningitis. J Infect; 49(3):229-35.
9. Thomas, KE, Hasbun R, Jekel J, Quagliarello VJ. (2002)The diagnostic accuracy of Kernig's sign, Brudzinski's sign and nuchal rigidity in adults with suspected meningitis. Clin Infect Dis.; 35(1):46-52.
10. Big, C, Reineck LA, Aronoff, DM. (2009) Viral infections of the central nervous system: a case-based review. Clin Med Res.; 7(4):142-6.
11. Sadati, M.,Nazarian, S.,Barati, B., Mehdi Zadeh, H. (2008)Identification of Hemophilicinfluenza and Streptococcus Nomonia using Multiple PCR, Baghyat Allah medical science university, Iran biological journal. Vol. 21
12. Mandell, R., Gordon Douglas JR J., Hn E,. Bennett. (2000)"Principle and practice of infectious diseases". 5th edition, London, Churchill Livingstone, PP: 2655-2692.
13. Herring, AC, Lee J, McDonald RA, et al. (2005) Transient neutralization of tumor necrosis factor alpha can produce a chronic fungal infection in an immune competent host: potential role of immature dendritic cells. Infect Immune; 73:39–49.
14. Javadi, M, Mohammadi, Sh. (2005) Management and treatment of invasive fungal sinusitis. RJMS.; 48(12): 69-74. [In Persian]