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Research Article

**HIV PATIENTS ALONG PRESENTING MENINGITIS
DEVELOPMENT AFTER TRAUMA & YIELDED
CRYPTOCOCCUS NEOFORMANS & STREPTOCOCCUS
PNEUMONIAE PATHOGENS GROWTH****Dr. Ahsan Mahmood, Dr. Amal Zafar, Dr. Muhammad Zaigham Tariq**
House Officer, Mayo Hospital Lahore**Abstract**

Meningitis is one of the serious diseases which has an association with the significant rate of mortality and morbidity among patients. The morbidity and mortality rates associated with meningitis are considerably high among patients. There is a rare occurrence of mixed meningeal infections because of the fungi and bacteria. These occurrences are exceptionally rare. In this particular research, we have studied a rare meningeal co-infection case with Streptococcus pneumoniae and Cryptococcus neoformans along with an unknown deficiency of human immune virus status at Jinnah Hospital, Lahore from February to September 2017. As such cases are rarely reported to the hospitals so for every cerebrospinal fluid, stringent screening of the specimen imperatively excludes the multiple pathogens presence. The evaluation of the immunodeficiencies among patients for isolated cases is an opportunity organism such as the requirement of the Cryptococcus.

Keywords: Meningeal Co-infections, Cryptococcosis, Post-Traumatic Meningitis and Cryptococcal Meningitis.

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INTRODUCTION:

Meningitis is one of the serious diseases which has an association with the significant rate of mortality and morbidity among patients. The morbidity and mortality rates associated with meningitis are considerably high among patients. There is a rare occurrence of mixed meningeal infections because of the fungi and bacteria. These occurrences are exceptionally rare. However, intra-ventricular shunt, immunosuppression, spinal / head injuries and surgical intervention may lead to infections of CNS (Central Nervous System) with the involvement of multiple organisms [1, 2].

In this particular research, we study a patient with an unknown HIV (Human Immunodeficiency Virus) status. This patient also presented the development of meningitis after trauma and CSF yielded two pathogens growth (Cryptococcus neoformans and Streptococcus pneumoniae). The patient was studied at Jinnah Hospital, Lahore in the timeframe starting from mid of February to mid of September 2017.

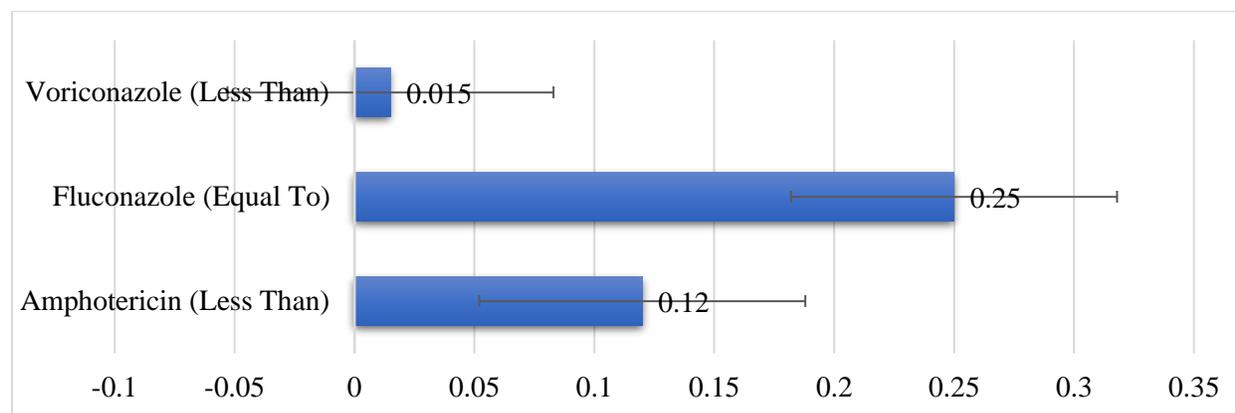
CASE REPORT:

The age of the patient studies during the research timeframe was thirty years. The patient presented an unknown comorbid which were experienced from road traffic accident (RTA) and caused depression of the skull with additional skull fractures of compound nature. Radiological evaluation of the patient's skull also presented pneumocephalus. The patient visited the physician in the hospital after a delay of nine days and complained about the clear watery nose discharge, stiffness of the neck with a headache and fever. The patient was treated with a lumbar puncture and necessary clinical evaluation was carried out by submitting CSF in the laboratory. There were no inflammatory cells as observed through CSF gram staining with various gram-positive diplococci and also rare for some of the yeast cells. We reported the positive encapsulation of the yeast cells through

Indian Ink Staining process. We did not perform any cryptococcal antigen test because of the financial constraints at our end. There was a β -hemolytic colonies growth as revealed through culturing process and they were identified as Streptococcus pneumoniae on the basis of morphological colonies, optochin sensitivity and gram staining. Streptococcus pneumoniae was possibly susceptible to erythromycin, chloramphenicol, ofloxacin, vancomycin, tetracycline and it was also resistant to penicillin having MIC (Minimum Inhibitory Concentrations) reported as (0.25 $\mu\text{g/ml}$). In the presence of Streptococcus pneumoniae, there was also the growth of some white and creamy colonies observed through chocolate agar and sheep blood. We inoculated and isolated these formed creamy white colonies on SDA (Sabouraud's Dextrose) agar and CMT (Corn Meal Tween) agar. After forty-eight hours through positive urea we identified Cryptococcus neoformans and on the CMT agar, we observed yeast cells (round buddings). We used commercially available systems of biochemical processing for Cryptococcus neoformans identification and verification. The isolate was reported as susceptible to amphotericin, fluconazole and voriconazole having respective MIC values of (< 0.12 $\mu\text{g/ml}$), (0.25 $\mu\text{g/ml}$) and (< 0.015 $\mu\text{g/ml}$) as shown in the given table with a graphical presentation [3, 4].

Table: Susceptibility of the Isolates

Isolate Susceptibility	MIC ($\mu\text{g/ml}$)
Amphotericin	<0.12
Fluconazole	0.25
Voriconazole	<0.015



We also made a contact with the primary physician of the patient and came to know that the patient had already received an initial treatment of metronidazole and ceftriaxone as an initial therapeutic intervention. We advised an additional use of amphotericin B and also advised the patients that not to take metronidazole anymore for onward treatment. However, the patient did not take any antifungal treatment because of financial constraints. We also did not evaluate the status of the immune as the patient did not receive any antifungal treatment because of low socioeconomic status. The patient responded for the initial treatment and there was no follow-up visit was paid by the patient in order to assess the further improvement.

DISCUSSION:

Undoubtedly, meningitis is one of the serious diseases which has an association with the significant rate of mortality and morbidity among patients. The morbidity and mortality rates associated with meningitis are considerably high among patients. There is a rare occurrence of mixed meningeal infections because of the fungi and bacteria. These occurrences are exceptionally rare. However, intraventricular shunt, immunosuppression, spinal / head injuries and surgical intervention may lead to infections of CNS (Central Nervous System) with the involvement of multiple organisms [1, 2]. The isolation of fungal and its related pathogens in CSF are reported scarcely as there are very few cases to mention till date. It is learnt through literary investigations that a meningeal co-infection along with *Cryptococcus neoformans* also include *Mycobacterium tuberculosis* (TB), *Toxoplasma*, *Plasmodium falciparum* and *Taenia solium* [5 – 8]. However, we also reported only two meningitis cases along with *Cryptococcus neoformans* co-infection and another co-infection of *Streptococcus pneumoniae*. Such outcomes were reported back in 1997 when a patient was presented with an incidence of AIDS (Acquired Immune Deficiency Syndrome) [9]. Whereas, the second patient was reported back in the year 2005 which was also affected by HIV infection. The patient was hospitalized for bacterial meningitis because of *Streptococcus pneumoniae* at the intensive care unit of the hospital; whereas, at a later stage interestingly it was a case of *Cryptococcus neoformans* [10]. The common factor reported in both the patients was immunosuppression as a number of the patients presented an onset of AIDS as well [11].

We hypothesized for our patients, there might be an underlying deficiency of the immune system which resulted in an onset of cryptococcal meningitis. The

outcome was totally incidental about the presentation of an acute post-traumatic bacterial meningitis because of the *Streptococcus pneumoniae*. Unfortunately, we never assessed the state of immune in the patient because the patient did not receive any antifungal therapy. Our outcomes also refer to another important hint that poor socioeconomic status of the patients leads to hindrances in the immunodeficiencies assessments, opportunistic infections outcomes are very much valuable for the future guidance of the physicians to treat the patients on the same lines as we did in this case.

An absence of the inflammatory cells as reported in the process of gram staining also provided additional evidence which ultimately increased the immunodeficiency suspicion in our patient. Another author also reported the same outcomes in another series [9]. It is also a known fact that at an advanced HIV infections stage along with immunity mediated by impaired cells the response of the humoral immune is also compromised [12].

CONCLUSION:

It is essential to carefully screen the samples of CSF especially when there is a non-availability of required and appropriate clinical information to laboratory staff. Bacterial aetiology presence never removes the presence of other associated pathogenic organisms. It is mandatory to remove multiple pathogens presence especially in the settings where the resources are less available or there is a scarcity of the resources. The evaluation of the immunodeficiencies among patients for isolated cases is an opportunity organism such as the requirement of the *Cryptococcus*.

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