The Clinical Significance of Neutrophilic Pleocytosis in Viral Central Nervous System Infections

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ABSTRACT

Background: Viral meningitis and encephalitis is typically characterized by a cerebrospinal fluid (CSF) lymphocytic pleocytosis. A CSF neutrophilic pleocytosis presentation has been described but its prognostic and clinical significance is unknown. The objectives of our study were to compare the clinical and laboratory characteristics of viral central nervous system (CNS) infections with CSF neutrophilic and lymphocytic predominance and to evaluate factors associated with adverse clinical outcomes (ACO).

Methods: We conducted a retrospective study of 182 patients with confirmed viral CNS infections from Houston, TX and New Orleans, LA from 1999 to 2013. The patients were divided into CSF neutrophilic pleocytosis (neutrophils >50%) (n=45) and CSF lymphocytic pleocytosis (lymphocytes + monocytes >50%) (n=137). We compared the clinical characteristics, laboratory findings, imaging results and clinical outcomes between two groups. An adverse clinical outcome was defined as a Glasgow outcome scale 1-4.

Results: Of the 182 patients, 45 (25%) patients had CSF neutrophilic pleocytosis. CSF neutrophilic predominance was more frequently seen in patients with enteroviral infection (64% vs 3%; p=0.001) and less commonly in herpetic infections (20% vs 46%; p=0.003). The CSF neutrophilic pleocytosis group also presented more commonly in younger patients (p=0.001) with more respiratory symptoms (P=0.04) and had higher CSF WBC (p=0.004). An adverse clinical outcome was presented in 29 patients (16%). Factors associated with ACO included arboviral infection and encephalitis presentation (P=0.05).

Conclusions: CSF neutrophilic pleocytosis occurs in 25% of patients with confirmed viral CNS infections and is most likely seen in younger patients with enteroviral infections and is associated with higher CSF pleocytosis but is not associated with higher adverse clinical outcome.

BACKGROUND

• Viral central nervous system (CNS) infection is characterized by cerebrospinal fluid (CSF) lymphocytic or monocytic predominance.

• CSF neutrophilic leukocytes can predominate early in the course of aseptic meningitis and is not limited to the first 24 hours of illness.

• The clinical significance of CSF neutrophilic predominance is unknown in patient with viral CNS infections.

OBJECTIVES

• To compare the clinical and laboratory characteristics, imaging results, and clinical outcomes of viral CNS infections with CSF neutrophilic predominance to CSF lymphocytic predominance.

• To evaluate factors associated with adverse clinical outcomes in viral CNS infection patients.

METHODS

• Retrospective study.

• We included patients with confirmed viral CNS infection from Houston, TX and New Orleans, LA from 1999-2013.

RESULTS

• 182 patients with viral CNS infection were included.

• 45/182 (25%) patients had CSF neutrophilic pleocytosis.

• CSF neutrophilic pleocytosis is not associated with higher adverse clinical outcomes.

CONCLUSIONS

• CSF neutrophilic pleocytosis occurs in 25% of patients with confirmed viral CNS infections.

• CSF neutrophilic pleocytosis is most likely seen in younger patients with enteroviral infections and is associated with higher CSF pleocytosis.

• In logistic analysis model, Arboviral infection and encephalitis presentation are factors associated with adverse clinical outcomes. The results were validated by bootstrap analysis at a P<0.05.

• CSF neutrophilic predominance in viral CNS infection is not associated with higher adverse clinical outcome.

REFERENCES

