# COMPARISON OF CYTOLOGIC AND BIOCHEMISTRY CEREBROSPINAL FLUID (CSF) PARAMETERS BETWEEN VIRAL AND BACTERIAL MENINGITIS

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## INTRODUCTION

Cerebrospinal fluid cytological and biochemical analyses are used to empirically distinguish bacterial and viral meningitis guiding early therapeutic decisions.

The aim of this study was to compare CSF cytological and biochemical findings in patients with community acquired viral and bacterial meningitis.

## METHODS

We included CSF samples sent to “Senne Liquor Diagnostico”. We considered bacterial meningitis every CSF in with at least one of the microbiological tests (bacterioscopy, latex antigen, or culture) was positive.

All cases of meningitis with enterovirus or herpes simplex positive PCR were considered of viral etiology.

Univariate CSF cytology and biochemistry data were compared with *t* test. Multivariate analysis was carried out with binary logistic regression.

## RESULTS

634 CSFs of bacterial meningitis and 524 CSFs of viral meningitis were included. CSF leukocyte count was significantly higher with bacterial meningitis (5750±27512 x 306.4±424.4 $mm^3$) (P<0,001). CSF glucose was significantly lower with bacterial meningitis (30.68±31.22 x 52.80±13.45 mg/dl) (P<0.001). CSF protein and lactate were significantly higher with bacterial meningitis (424.1±645.9 x 46.76±29.05 mg/dl, P<0.001 and 87.28±58.85 x 17.76±4.55 mg/dl, P<0.0001; respectively).

After binary logistic regression the leukocytes cout, protein, and lactate remained statistical significance (P<0.0001). Glucose was the only variable not significant;y different between viral and bacterial meningitis after logistic regression (P=0.771)

## CONCLUSION

All parameters but glucose were independently associated with meningitis etiology. Glucose was significatly lower with univariate analysis but not significant after binary logistic regression. It is possible that the lack of determination of CSF/serum glucose ratio may have precluded statistical significance with this variable with multivariate analysis.

**Figure 1:** Univariate comparisons of CSF data between viral and bacterial meningitis (P<0.0001)

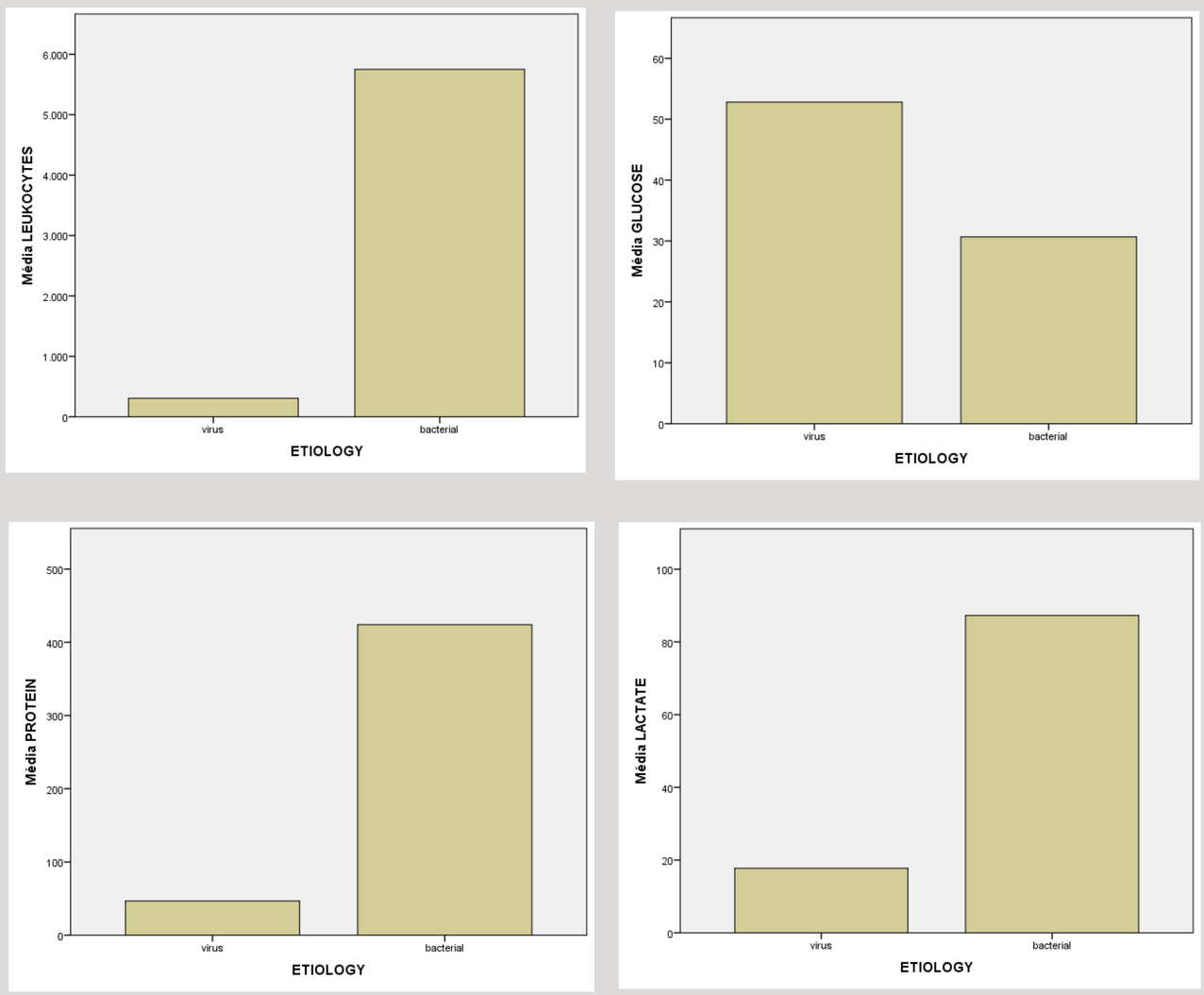


**Table 1:** Multivariate analysis of CSF data of viral and bacterial meningitis

| Variables in the Equation | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | B | S.E. | Wald | df | **Sig.** | Exp(B) |
| | LEUKOCYTES | ,000 | ,000 | 28,471 | 1 | **,000** | 1,000 |
| | GLUCOSE | ,002 | ,006 | ,085 | 1 | **,771** | 1,002 |
| | PROTEIN | ,013 | ,003 | 22,846 | 1 | **,000** | 1,013 |
| | LACTATE | ,182 | ,017 | 116,056 | 1 | **,000** | 1,200 |
| | Constant | -5,981 | ,516 | 134,408 | 1 | **,000** | ,003 |

a. Variable(s) entered on step 1: LEUKOCYTES, GLUCOSE, PROTEIN, LACTATE.

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