NTproBNP is not a good prognostic marker in patients with advanced heart failure on ambulatory levosimendan infusion program

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Background:

Intermittent administration of levosimendan infusions have been shown to reduce heart failure (HF) hospitalizations in advanced heart failure (ADHF) patients and have been used for those who are not candidates for heart transplant or left ventricular assist devices (LVAD) or as bridge to these therapies.

Aim:

To evaluate the prognostic value of NTproBNP level variation in ADHF patients on intermittent levosimendan infusion program.

Methods:

Prospective registry of consecutive ADHF patients admitted on the ambulatory levosimendan infusion program of a single center between **May 2020 and December 2022**.

Patients were admitted if:

- ✓ Presented HF with reduced ejection fraction (HFrEF)
- ✓ Recurrent HF hospitalizations or sustained clinical decline (NYHA class ≥3 and progressive intolerance to medical therapy or escalating diuretic dose).

Levosimendan protocol:

Administered as a 24-hour monthly infusion.

Suspended in case of death, heart transplantation or LVAD implantation, or stable HF.

NTproBNP levels before program initiation and after 1, 3, 6, and 9 months were registered, as well as NTproBNP variation immediately before and after levosimendan infusion (delta NTproBNP).

Results:

32 patients met the inclusion criteria

75% males (n=24)
Mean age of 65.8 ± 12.8 years

All patients had HFrEF, 56.3% (n=18) of ischemic etiology

96.9% (n=31) was in NYHA class 3 and 3.1% (n=1) in NYHA class 4

Median NTproBNP level before levosimendan initiation 7004 (IQR 3079 – 13254) pg/mL

- ✓ Levosimendan program **significantly reduced HF hospitalizations** at 6 months (median 1 [IQR 0-2] vs 0 [IQR 0-1], p=0.005).
- ✓ **Median NTproBNP levels significantly decreased after the 1st month of therapy** (7004 [IQR 3079 – 13254] vs 3720 [IQR 2571 – 6988], p=0.04), and remained stable afterwards (Figure).
- ✓ **Median NTproBNP decreased after each levosimendan infusion, but delta NTproBNP was not different over time** (median delta NTproBNP at 1 month -988 [IQR -2139 – 179] pg/mL, at 3 months -1771 [IQR -2435 – -97] pg/mL, at 6 months -420 [-2136 – 258] pg/mL, p=0.287).
- ✓ Positive NTproBNP delta variation after levosimendan infusion occurred in 31.6% [n=6] of patients at 1 month and 30.0% [n=3] at 6 months but was not a predictor of HF hospitalizations (OR=2.8, CI 95 0.2 – 40, p=0.448).
- ✓ Absolute NTproBNP values at 3, 6 and 9 months were not independent predictors of stable HF and subsequent levosimendan program interruption (OR=1.00, CI 95 0.9 – 1.0, p=0.715).

Conclusions

NTproBNP is not a good prognostic marker in ADHF on levosimendan intermittent infusion program and should not be used alone for decision of program discontinuation. The decrease and stabilization of NTproBNP initiation of the levosimendan program reflects disease stability, also demonstrated by the reduction in HF hospitalizations.

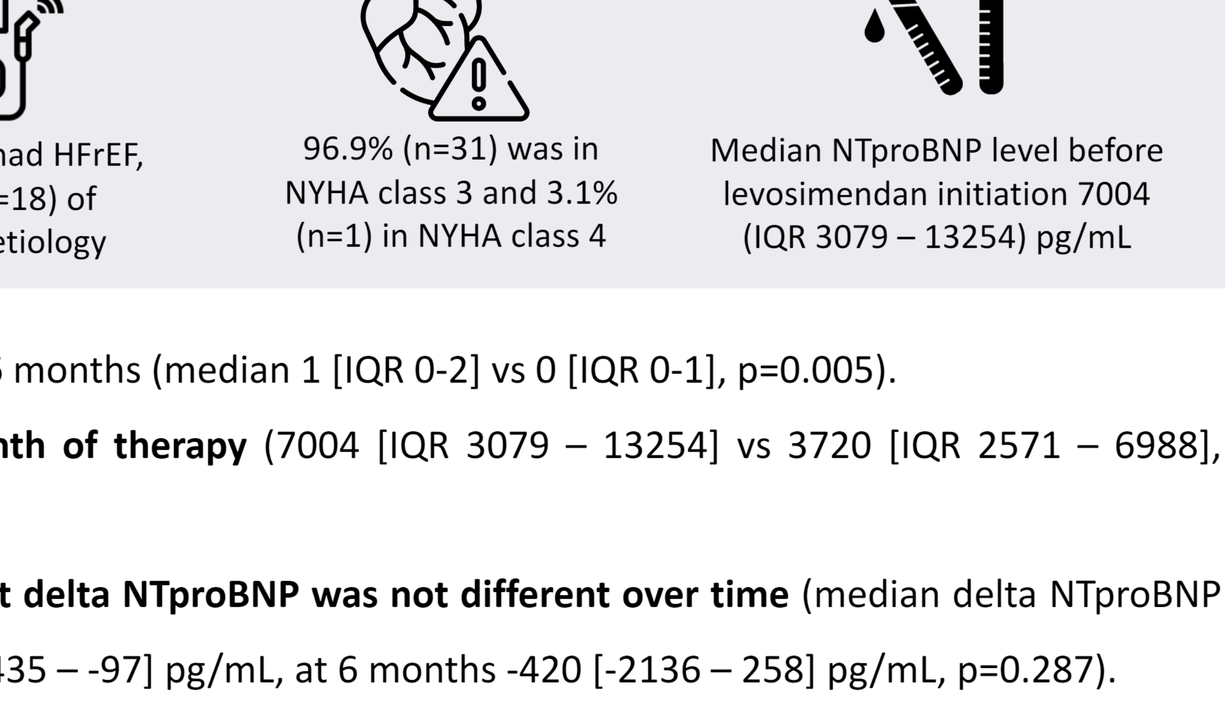

Figure 1 – Absolute NTproBNP levels before levosimendan infusion program initiation and after 1, 3, 6 and 9 months.