Physico-chemical stability of valproate sodium in polypropylene syringe for administration in the Intensive Care Unit.

Lardinois B, Baltzis A, Braibant M, Godet M, Jamart J, Bihin B, Soumoy L,Galanti L, Hecq JD
Drug Stability Research Group, CHU UCL Namur, Yvoir, Belgique
Contact : jean-daniel.hecq@uclouvain.be

Background

The intensive Care Unit (ICU) use drug solutions within higher concentration to avoid fluid overload.

Purpose

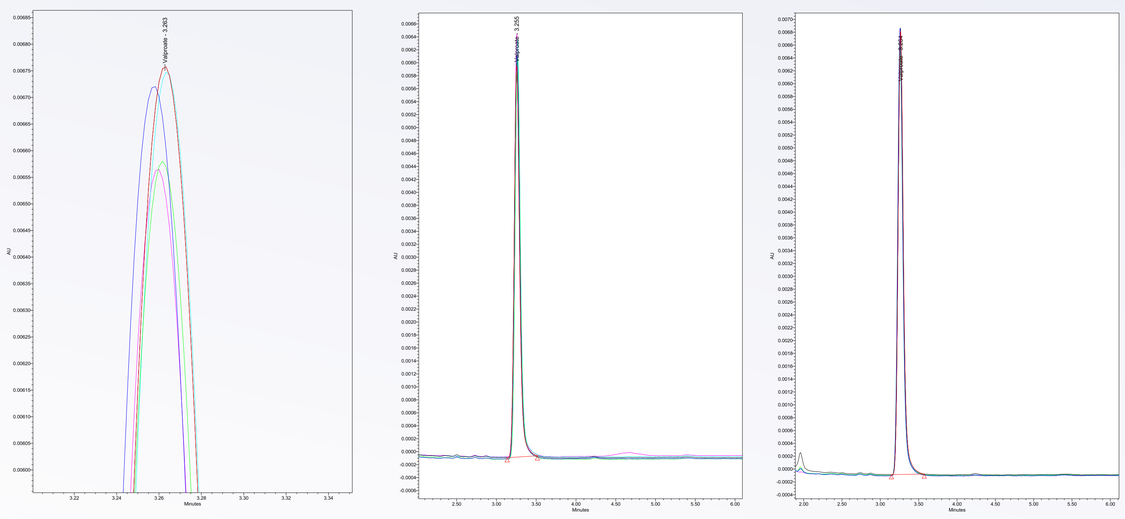
To evaluate the physico-chemical stability of concentrated solution of valproate sodium in polypropylene syringe during 30 days at 5 ± 3°C.

Materials and Method

Five syringes of 50 ml, containing 20.0 mg/ml of valproate sodium in 0.9 % NaCl were prepared and stored at 5 ± 3°C during 30 days.

Immediately after preparation and periodically during the storage, valproate concentrations was measured by a high-performance liquid chromatography (HPLC).

Spectrophotometric absorbance at different wavelengths, pH measurement and microscopic observations were also performed.



Chromatogram showing degradation test before heating (red curve) and after heating (green curve) at natural, acid and alkaline pH of valproate

Results

All solutions were physically stable during the whole period storage at 5 ± 3°C: no color change, turbidity, precipitation or opacity at visual observation.

No significant pH variations or optic densities were observed.

Any crystals were seen by microscopic analysis. Solutions are considered chemically stable as the lower limit of the 95 % unilateral confidence interval on the mean remained above 90 % of the initial concentration for at least 30 days.

jour	Mean	Sd	CI.lwr	PI.lwr
0	99.96	1.66	98.78	93.42
1	98.62	1.87	98.78	93.37
2	99.67	5.52	98.78	93.33
3	97.70	1.27	98.78	93.28
4	101.71	4.99	98.78	93.23
7	97.68	1.74	98.74	93.08
9	101.83	7.26	98.68	92.98
11	99.88	1.41	98.60	92.87
14	104.50	3.22	98.42	92.70
16	98.28	2.50	98.26	92.58
18	97.16	3.57	98.08	92.45
25	95.92	3.64	97.31	92.00
28	98.70	3.16	96.94	91.79
30	98.90	2.87	96.69	91.64

Concentration moyenne +/- ecart-type (en de la concentration initiale).

CI.lwr=limite inferieure de l'intervalle de conance unilateral a 95 pourcent sur la moyenne. PI.lwr=limite inferieure de l'intervalle de predicion unilateral a 95 pourcent. Concentration initiale = 19.6 +/- 0.761g/100 ml.

Conclusion

Solutions of valproate sodium 20.0 mg/ml in syringe of 0.9 % NaCl are physically and chemically stable for at least 30 days when stored in syringes at 5 ± 3°C and may be prepared in advance by a CIVA

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Possible conflict of interest : nothing to disclose.