Cat. No 7-461

BS-400
Chemistry Analyzer

A-400 VALPROIC ACID

DIAGNOSTIC KIT FOR DETERMINATION OF VALPROIC ACID CONCENTRATION

INTRODUCTION
Valproic acid (2-propylpentanoic acid) is anticonvulsant drug used in all types of epilepsy in children and adults. It is absorbed rapidly and almost completely, however it reaches steady-state after 2-5 days. Over 90% of valproic acid is eliminated by liver metabolism. It pharmacokinetically interacts with other anti-epileptic drugs. The reason for monitoring of valproic acid concentration is lack of correlation between dose and concentration at good correlation between concentration and therapeutic effect and also significant diversity of pharmacokinetics, dependent on age and accompanying anti-epileptic therapy.

METHOD PRINCIPLE
Immunoturbidimetric method; inhibition of agglutination.
Increase of absorbance is inversely proportional to the concentration of valproic acid in the sample.
Valproic acid, which is present in the sample forms immune complexes with specific antibodies contained in the first reagent. After adding a second reagent containing polistyrene latex particles coated with valproic acid, agglutination is inhibited proportionally to valproic acid concentration in the sample.

REAGENTS
Package

1-Reagent	1 x 31 ml
2-Reagent	1 x 12 ml

The reagents when stored at 2-8°C are stable up to expiry date printed on the package. The reagents are stable for 4 weeks on board the analyser at 2-10C. Protect from light and avoid contamination!

Concentrations in the test
Suspension of latex particles coated with valproic acid, buffer with monoclonal antibodies to valproic acid.

Warnings and notes
- Product for in vitro diagnostic use only.
- The reagents should be used by suitably qualified laboratory personnel only in accordance with intended purpose.
- Do not freeze reagents!
- Before use reagent bottles should be shaken gently by inverting several times to dislodge air bubbles and ensure reagent homogenity.
- Human source material from which this product has been derived has been tested for HBsAg and antibodies to HIV 1 and HIV 2 and found to be non-reactive. However this material and all patient samples should should be handled as though capable of transmitting infectious disease.
- The reagents contain sodium azide (< 0.1%) as a preservative. Avoid contact with skin and mucous membranes.
- This assay should not be run immediately after gentamicin, digoxin, phenytoin assays. It is recommended to assay valproic acid in separated batch of samples.

SPECIMEN
Serum.
Samples may be stored up to 3 days at 2-8°C or longer at -20°C.
Any additional clotting or precipitation that occurs due to freeze/thawing should be removed by centrifugation prior to analysing the valproic acid of that sample.
Nevertheless it is recommended to perform the assay with freshly collected samples!

PROCEDURE
These reagents may be used in automatic analyser BS-400.
1-Reagent and 2-Reagent are ready to use.
For reagent blank CALIBRATOR 1 is recommended.

APPLICATION
BASIC

Test information		Reagent volume	
No.	80	R1	240
Test	VPA	R2	75
Full Name	VALPROIC ACID	R3	
Std. No.	80	R4	

Sample volume

Standard	3	15	10
Increased	6	15	10
Decreased			

Reaction Parameters

Reac. Type	End-point	Direction	Increase	
Pri. Wave	605	Rgt. Blank	49	50
Sec. Wave		Reac. Time	68	70

Result Setup

Decimal	0.01	Slope	1
Unit	µg/ml	Inter	0

Judgment Criteria

Absorbance	0	0	Lin. Range	10.1	150
Incre. Test	0		Lin. Limit		
Decre. Test	0		Subs. Limit		

□ Prozone ○ Rate ○ Antigen

Q1	0	Q2	0	Q3	0	Q4	0
PC	0			ABS	0		

CALIBRATION
Calibration

Rule	Logit Log 5P
Replicate	1
K	

Judgment Criteria

Sensitivity	Blank Abs.
Factor Diff.	Error Limit
SD	Corr. Coeff.

THERAPEUTIC RANGE [7]

therapeutic concentration	50 – 100 µg/ml
toxic concentration	> 100 µg/ml

Some patients achieve the desired therapeutic response at levels outside this range, so it is recommended to consider the need to establish an individual therapeutic ranges for each patient

QUALITY CONTROL
For internal quality control it is recommended to use the CORMAY TDM CONTROLS (Cat. No 5-107) with each batch of samples.
For the calibration of automatic analysers systems the CORMAY VALPROIC ACID CALIBRATORS kit (Cat. No 5-151) is recommended.
The calibration curve should be prepared every 7 days, with change of reagent lot number or as required e.g. quality control findings outside the specified range.

PERFORMANCE CHARACTERISTICS

The following results have been obtained using automatic analysers BS-400 and/or Rx Daytona. Results may vary if a different instrument is used.

- **Sensitivity**

10.1 µg/ml.

- **Linearity**

150 µg/ml.

- **Specificity / Interferences**

Haemoglobin up to 1 g/dl, bilirubin up to 25 mg/dl, triglycerides up to 1000 mg/dl and intralipid up to 800 mg/dl do not interfere with the test.

The specificity of the assay was evaluated by assaying compounds whose chemical structure or concurrent usage could potentially interfere with the valproic acid assay.

Substance	Concentration (µg/ml)	Cross-Reactivity
Carbamazepine	1000	-0.17%
Clonazepam	100	4.01%
Diazepam	100	1.30%
Ethosuximide	1000	0.18%
Phenobarbital	750	0.07%
Phenytoin	1000	0.39%
Primidone	1000	0.21%
2-N-Propyl-2-pentenoic Acid	100	3.91%
2-N-Propyl-3-pentenoic Acid	50	10.06%
2-N-Propyl-4-pentenoic Acid	10	38.30%
2-Hydroxy-2-N-propylpentanoic Acid	100	3.69%
3-Hydroxy-2-N-propylpentanoic Acid	10	15.20%
5-Hydroxy-2-N-propylpentanoic Acid	25	8.88%
3-Oxo-2-N-propylpentanoic Acid	50	4.38%
4-Oxo-2-N-propylpentanoic Acid	15	26.93%
2-(1'-Propenyl)-2-pentenoic Acid	50	4.12%
3-Oxo-2-(2'-Propenyl)pentanoic Acid	100	-1.65%
2-(2'-Propenyl)-4-pentenoic Acid	25	8.76%
2-N-Propylglutaric Acid	50	3.50%
2-N-Propylmalonic Acid	500	0.16%
2-N-Propylsuccinic Acid	100	4.64%
Salicylate	3000	-0.01%
2-Ethyl-2-phenylmalonamide	100	-0.10%
3-Ketovalproic acid	150	0.40%

- **Precision**

Repeatability (run to run) n = 10	Mean [µg/ml]	SD [µg/ml]	CV [%]
level 1	24.7	1.57	6.34
level 2	81.4	1.53	1.87
level3	136.0	2.97	2.18

Reproducibility (day to day) n = 20	Mean [µg/ml]	SD [µg/ml]	CV [%]
level 1	25.9	2.14	8.27
level 2	78.8	1.74	2.21
level 3	137.0	3.80	2.77

- **Method comparison**

A comparison between CORMAY reagent (y) and commercially available assay (x) using 55 samples gave following results:
y = 1.06 x + 0.35 µg/ml;
R = 0.99 (R – correlation coefficient)

WASTE MANAGEMENT

Please refer to local legal requirements.

LITERATURE

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