Validation of dried blood spot sampling in therapeutic drug monitoring of cyclosporin

Published: 09-02-2009
Last updated: 06-05-2024

Validation of the DBS sampling method of cyclosporin in TDM practice

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Autoimmune disorders
Study type	Observational invasive

Summary

ID

NL-OMON34000

Source
ToetsingOnline

Brief title
DBS TDM CsA

Condition

- Autoimmune disorders

Synonym
Transplantation of hematopoetic stem cells or kidney

Research involving
Human

Sponsors and support

Primary sponsor: Vrije Universiteit Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W,A.J. Porsiusfonds

Intervention

Keyword: cyclosporin, dried blood spot sampling, TDM, validation

Outcome measures

Primary outcome

The CLSI EP09-A guideline is adapted.

EP9 assumes that the two methods being compared will yield essentially identical results. The Medically Allowable Error is defined 15%. This Medical Allowable Error will be used to determine:

1. the maximum allowable difference between specimens across methods,

2. the maximum allowable difference between duplicate specimens for the same method,

3. the distance between the scatter plot bounds and the regression line.

Secondary outcome

Outlier determination. The outlier identification process is quite complex. (See the EP9 document for details). In general, an outlier is detected either when duplicate results for the same method are too different, or when a pair of results across methods is too different. In either case, all results for both specimens are declared to be outliers.

Test for adequate range of results.

Computation of key statistics: regression slope, intercept, and standard error of estimate; 95% confidence interval for predicted Medical Decision Points.

Visual check for linearity.

Visual check for "uniform scatter". The purpose of this test is to decide how to compute the medical decision points: by Partitioned Residuals or by Deming regression.(13) Whereas the ordinary linear regression method assumes that only the Y measurements are associated with random measurement errors, the Deming method takes measurement errors for both methods into account.

Examination of the bias plot. The bias at the high end and the bias at the low end will be compared.

Study description

Background summary

The immunosuppressive drug cyclosporin has a narrow therapeutic window and large inter- and intraindividual variability of pharmacokinetics (1;2). Therapeutic drug monitoring (TDM) of cyclosporin is usually performed in ethylenediamine tetraacetic acid (EDTA) blood, obtained by venous sampling by technicians. Dried blood spot sampling (DBS) could be a useful alternative sampling method. With DBS, capillary blood is obtained from a fingerprick with an automatic lancet by the patients themselves and the drop of blood is applied to sampling paper. After drying, the paper with the blood spot sample is sent by mail to the laboratory

Study objective

Validation of the DBS sampling method of cyclosporin in TDM practice

Study design

We will collect venous and fingerprick blood samples at the same time. Venous sampling will be done by venapuncture and the EDTA blood samples are collected and stored at 4°C until analysis. Fingerprick blood samples are collected using Glucolet 2 Automatic Lancing Device (Bayer, Mishawaka). Samples are collected

from the fingertip. The first drop is discarded and the next 2 drops are collected to fill 2 8-mm premarked circles on the sampling paper (no. 10,535,097, obtained from Whatman Schleicher & Schuell, Dassel, Germany). Volume of the blood drops of patients will be approximately 30 µl and blood spots of about 10-mm diameter are produced. The blood spots are allowed to dry at room temperature and packed in sealable plastic minibags. On arrival in the laboratory, the blood spots are visually inspected. Criteria are complete, homogenous, and symmetric filling of the 8-mm circle and dark-red colour on both sides of the paper. Paper disks with a diameter of 7.5mm are punched out with an electromagnetic driven hole puncher. Dried blood spot sampling is compared with our routine assays in venous blood.

Study burden and risks

The study bears minimal risk for the subjects.

Contacts

Public
Vrije Universiteit Medisch Centrum

de Boelelaan 1117
1081 HV Amsterdam
Nederland
Scientific
Vrije Universiteit Medisch Centrum

de Boelelaan 1117
1081 HV Amsterdam
Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

older than 18 years

Exclusion criteria

No informed consent

Study design

Design

Study type: Observational invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	07-01-2010
Enrollment:	40
Type:	Actual

Ethics review

Approved WMO

Date:	09-02-2009
Application type:	First submission
Review commission:	METC Amsterdam UMC

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL23749.029.08