CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

Detection of the antimalarials QHS, ARTS, and DQHS

Purpose

Qinghaosu ("ching-how'-soo"), the active antimalarial principle of the herb qinghao, is a sesquiterpene lactone endoperoxide. It and its synthetic derivatives artesunic acid (ARTS) and dihydroqinghaosu (DQHS) are more effective than the traditional antimalarial, Chloroquine. Pharmacokinetic studies of these compounds in blood require a sensitive and accurate assay procedure.

Existing Methods

TLC, which is not sensitive enough for the low dosages involved in therapy.

Reference

Analysis of Artesunic Acid and Dihydroqinghaosu in Blood by High-Performance Liquid Chromatography with Reductive Electrochemical Detection. Z.M. Zhou, J.C. Anders, H. Chung and A.D. Theoharides, J. Chromatogr. 414(1987) 77-90.

Conditions

Detector: LC-4B detector coupled to an LC-19 transducer.
Electrode: TL-6A Hg/Au
Potential: -0.8 V vs. Ag/AgCl
Column: 5 µm, spherisorb phenyl, 250 x 4.6 mm and 250 x 2.0 mm
Guard Column: Spheri 5 cyano, 30 x 4.6 mm
Mobile Phase: 82% (v/v) 0.1 M ammonium acetate (pH 7.1); 18% acetonitrile. Flow rate = 1.5 mL/min (4.6 mm column) and 0.7 mL/min (2.0 mm column).
Linear Range: Linear in the µg range for ARTS and DQHS and in the ng range for DQHS.
Detection Limit: not determined.

Sample Preparation

Blood samples containing ARTS were extracted with 3.5% sodium bicarbonate followed by acetonitrile, then centrifuged. The supernatant was dried and redissolved in mobile phase. Methyl tert-butyl ether was used as the extraction solvent for DQHS. QHS was included with both compounds as an internal standard.

Notes

Although good resolution was obtained with both columns, QHS eluted after 13.7 min. on the larger column and 22.0 min. on the smaller.

Mobile phase and samples were deoxygenated by purging with Argon gas.

This determination can be duplicated with the BAS 200 Problem Solver, which has a built-in deoxygenation system.

The information in this publication is supplied as a service to our customers. Performance of the methodology has not necessarily been verified by BAS technical staff.

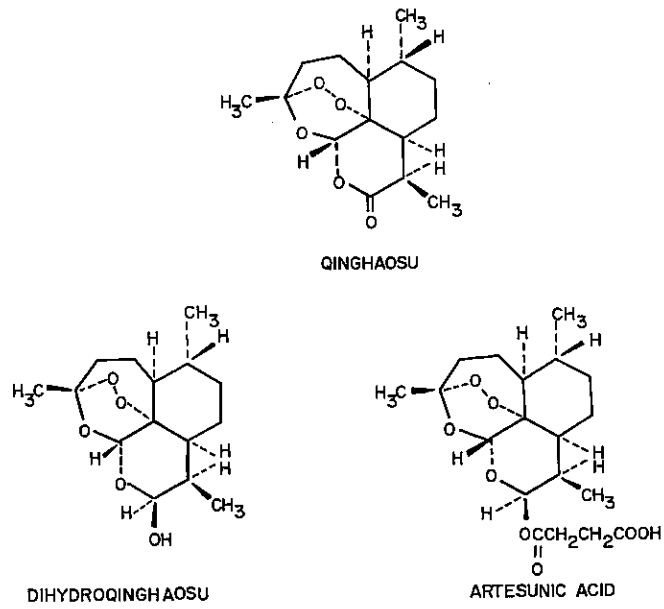

Figure 1. Structures of qinghaosu, dihydroqinghaosu and artesunic acid.

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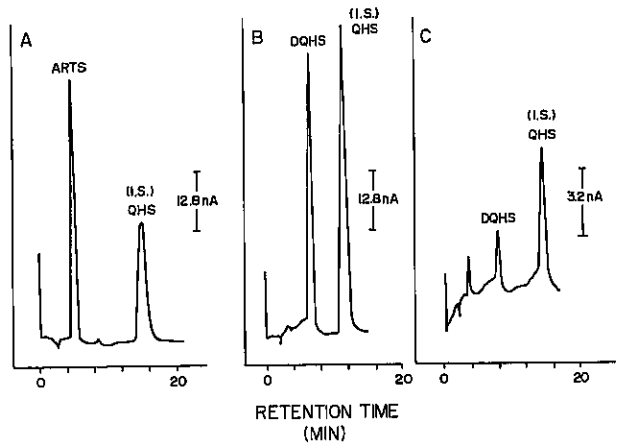

Figure 2. Chromatograms of human blood spiked with (A) ARTS (10 µg per 0.5 mL), (B) DQHS (2.5 µg per 0.5 mL) and (C) DQHS (200 ng/mL).