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Technical Note

Simple and fast chromatographic method for the determination of sotalol in human serum

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Abstract

We developed a method for the determination of sotalol in human plasma. After a simple deproteinization of the sample, we submit the supernatant to high-performance liquid chromatography with fluorescence detection. A few minutes are necessary to complete the analysis. © 1998 Elsevier Science B.V.

Keywords: Sotalol

1. Introduction

We have developed a new method for the determination of serum levels of sotalol that is simpler and faster than previous methods [1–5]. It allows quick and inexpensive sample pretreatment, fast analyses and the equipment required is easy accessible to all laboratories that perform routine high-performance liquid chromatographic (HPLC) analysis.

2. Materials

All reagents and chemicals were of analytical grade and were purchased from Merck (Darmstadt, Germany). To obtain working standards of sotalol, we started with a pharmaceutical preparation that is widely available (Sotalex, Bristol-Myers Squibb). Chromatography eluents were of HPLC grade.

2.1. Apparatus and chromatographic conditions

We used a Jasco DV-312 pump equipped with a Perkin-Elmer LS30 luminescence spectrometer as the detector. The set wavelengths were: λ_{ex}=235 nm and λ_{em}=300 nm. The signal from the fluorometer was detected by a Shimadzu C-R1B integrator (the set attenuation values were one and four, respectively). The analytical column was a Supelcosil LC-18, 15 cm long, 4.6 mm I.D., 5 μm particle size, preceded by a Supelguard LC-318 guard column (Supelco, Bellefonte, PA, USA). The composition of the eluent was water–85% (w/w) H_3PO_4–triethylamine–acetonitrile (500:3:1.5:25, v/v). The flow-rate was 1 ml/min.

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2.2. Sample preparation

To one volume of human serum, 0.1 volume of a solution of 10% $ZnSO_4$ (w/v) and 0.1 volume of acetonitrile (which improves the deproteinization) were added. After 15 min, the sample was centrifuged at 10 000 *g* (using an Abbott TDx centrifuge) for 10 min and 10 μl were injected through a Rheodyne 7125 injector valve equipped with a 50-μl loop. A standard curve was prepared by adding scalar amounts of sotalol to a human serum pool. No internal standard was required, due to absence of any extraction procedure.

3. Results and discussion

Fig. 1 shows the appearance of a patient receiving a 160-mg/day oral dose of sotalol. The linearity was investigated and verified up to 2500 ng/ml. Recovery was found to be 98%. We could easily detect concentrations of sotalol as low as 50 ng/ml when 50 μl of sample were injected (Fig. 2). Precision tests (within-day and day-to-day led to C.V. (%) values of 2.5 and 3.6, respectively, at the 1000 ng/ml level.

We believe that this method is suitable for routine analysis.

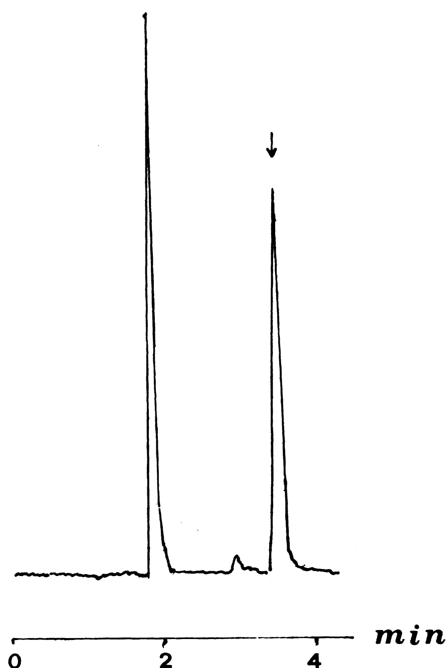

Fig. 1. Representative chromatogram of a patient receiving 160 mg/day of sotalol. 10 μl injected. The arrow indicates the sotalol peal.

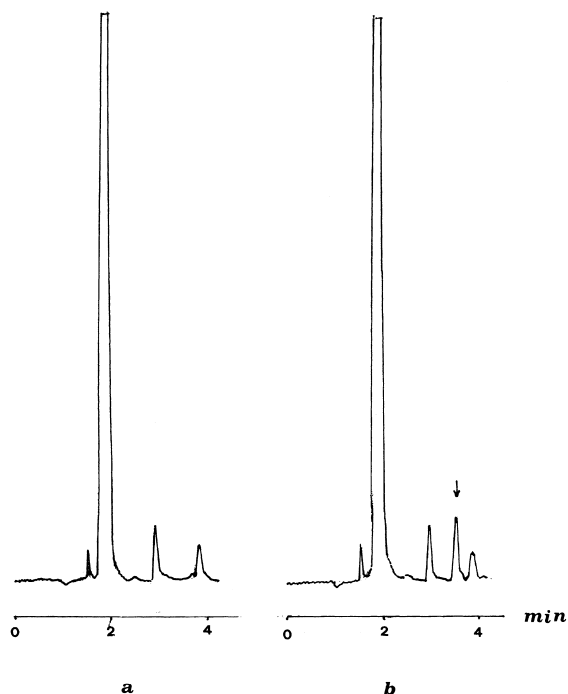

Fig. 2. Unspiked human serum pool (a), and the same pool spiked with 50 ng/ml of sotalol (b). In both cases 50 μl of supernatant were injected.

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