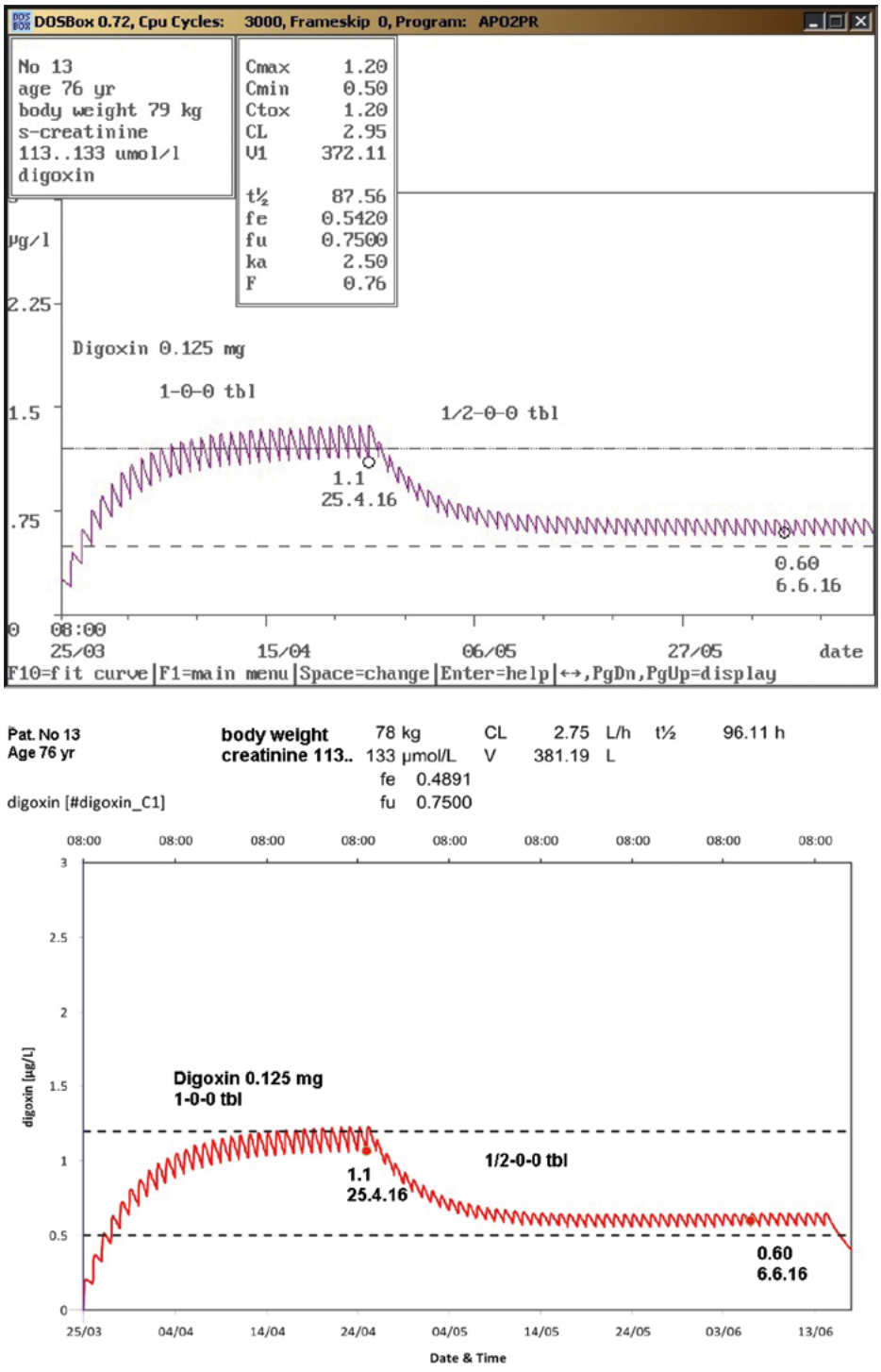
MwPharm was originally developed in 1991 and a year later the first fully functional version for DOS platform (MwPharm) was released. The program is developed further in order to implement the latest developments in the field of pharmacokinetics. It consists of a database with over 180 drugs. Pharmacokinetic (PK) models include up to 3 compartment systems combined with injection, infusion, oral and intramuscular inputs. Dosage regimen selection is implemented in a unique interactive fashion. Its qualities were honored as the best in a comparative benchmark study [4]. MwPharm++ is the Windows successor of the well-known DOS software, with a broader spectrum of models, available since 2014 as a reaction to the worse support of the DOS system on the later versions of Windows. After its release, the company had decided to not develop DOS versions anymore, even though they have been world widely used with success. Department of clinical pharmacology at University hospital Ostrava has been using DOS version since 1997 (version 2.0), upgraded to version 3.30 since 1999. It is still used as a referential because there is long-term experience with it. The Windows version was implemented into the department's internal service shortly after its first release and is periodically updated in accordance to available releases.

The hypothesis underlying the current study was that actually used Windows version of the MwPharm software can be used for TDM interchangeably with popular, long-term used, but in these times unsupported DOS version.

**Fig. 1.** *Pharmacokinetic profile of digoxin in a) DOS model, b) Windows model. $C_{max}$, maximal concentration; $C_{min}$, minimal concentration; $C_{tox}$, toxic concentration; CL, total plasma clearance; $V_1$, volume of distribution; $t_{1/2}$, elimination half-life; fe, extrarenal fraction; fu, free fraction of a drug (digoxin) in a plasma; ka, absorption rate constant; F, absolute bioavailability*




## Materials and methods

### Study population

Routine clinical pharmacokinetic data were retrospectively collected from patients at University hospital Ostrava and its departments. 45 patients were screened for eligibility, of whom 16 were excluded from the study group. Finally, 29 subjects (26 hospitalized, 3 outpatient) were included and all of them supervised by medical and nursing staff in 2016. 23 patients with multidrug treated systolic HF were 65–92 years old, 4 patients with atrial fibrillation were 55–64 years old, 1 pregnant woman treated due to fetus tachycardia was 27 years old and 1 infant with Tetralogy of Fallot was 11 months old. The study was performed according to the Declaration of Helsinki, and the hospital ethics review board approved the protocol. Exclusion criteria were as follows: (1) unavailable data of dosage of digoxin, (2) only one measurement.

Treatment of systolic HF was based on the European Society of Cardiology (ESC) guidelines for treatment acute and chronic HF [5]. All patients received digoxin (Digoxin Léčiva®, Zentiva, Prague, Czech Republic) as a part of their treatment at a median dose of 0.125 mg (range 0.063