

THE SECURITY OF PHARMACOKINETIC INFORMATION IN ELECTRONIC HEALTH RECORDS

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OBJECTIVES

To evaluate the quality and quantity of information recorded in EHRs concerning pharmaceutical interventions (PIs) generated by therapeutic drug monitoring (TDM).

METHODS

For 6 months (February-August 2011), all **onco-haematology** in-patients who were receiving **vancomycin** (≥ 3 doses) were evaluated. **Variables:**

RENAL FUNCTION (RF)				
Classification RF	Severe RI	Moderate RI	Mild RI	Normal RF
CrCl (ml/min)*	<10	10-50	50-90	>90
N	0	8	13	17

RI: renal impairment; CrCl*: creatinine clearance by Cockcroft-Gault equation (Cr capped at 0,6 or 0,8 for >75 years old, adjusted weight used for obese patients (real weight>20% ideal weight)).

PHARMACEUTICAL INTERVENTION IMPORTANCE (PII)			
Classification PII	Low	Moderate	High
Cp related to OTR	In OTR	On the limit of OTR	Out of OTR
N	21 (28%)	4 (5%)	51 (67%)

OTR: optimal therapeutic range; Cp: plasma vancomycin concentration. A higher level of PII was assigned for patients with previous high PII, on transition assistance or under different attending doctors.

COMPLETENESS OF ELECTRONIC HEALTH RECORDS (EHRs)		
RF record	RF evolution	Cr
TDM record	request	result
RF: renal function; TDM: therapeutic drug monitoring; PI: pharmaceutical intervention		

OTHER VARIABLES
Odds ratio (OR) of TDM process (request and result) and RF evaluation record in EHRs related to PII and RF, by binary logistic regression.

Statistical analysis: Categorical variables were expressed as frequency and percentage (%); normal quantitative variables as mean and 95% confidence interval (95%CI); non-normal quantitative variables as median and interquartile range (IQR). Normality tested by Kolmogorov-Smirnov. SPSS v.17 was used.

RESULTS

TDM was performed for 39 (81%) of **48 patients** receiving vancomycin. The median age was 57 years (95%CI: 52-62); 26 were male (67%); 21 had mild to moderate RI (54%).

There were **76 PIs** [median 2/patient (IQR: 2)], 51(67%), 4 (5%) and 21 (28%) of high, medium and low importance, respectively; **67(88%) were accepted**.

The EHRs did **not record RF evolution, TDM requests and results or PIs** in **53 (70%), 23 (30%), 39 (51%) and 61 (80%) cases** respectively.

INFLUENCE OF PII AND RF ON COMPLETENESS OF EHRs				
Variable	Related to	OR	95% CI	p
Recorded TDM request	Moderate RI vs normal RF	0,27	0,75-0,94	0,04*
	Mild RI vs normal RF	1,42	0,39-5,18	0,596
Recorded TDM result	High vs low PII	3,04	1,02-9,1	0,046*
	High vs moderate	7,5	0,65-87,19	0,107
Recorded RF evolution	Moderate RI vs normal RF	4,25	1,16-16	0,029*
	Moderate vs mild RI	2,83	0,87-9,23	0,084

*linear trend
TDM: therapeutic drug monitoring; PII: pharmaceutical intervention importance; RI: renal impairment; RF: renal function

DISCUSSION

The **low percentage recording** of TDM-related variables and pharmacist interventions in EHRs potentially limits interprofessional communication and the decision-making process.

Nevertheless, some **factors** seem to **influence EHRs recording**: higher PII increases TDM result recording, while more severe RI increases both RF and TDM request recording.

CONCLUSIONS

Clinical pharmacists need to safeguard the information they have discovered by **recording their interventions in the EHR** as a clinical episode in comprehensive patient care. **This will increase the visibility of the pharmacist and the effect of his/her actions.**