

Patient Non-Adherence to Antibiotics for Acute Infectious Diseases: *other reasons than lack of knowledge?*



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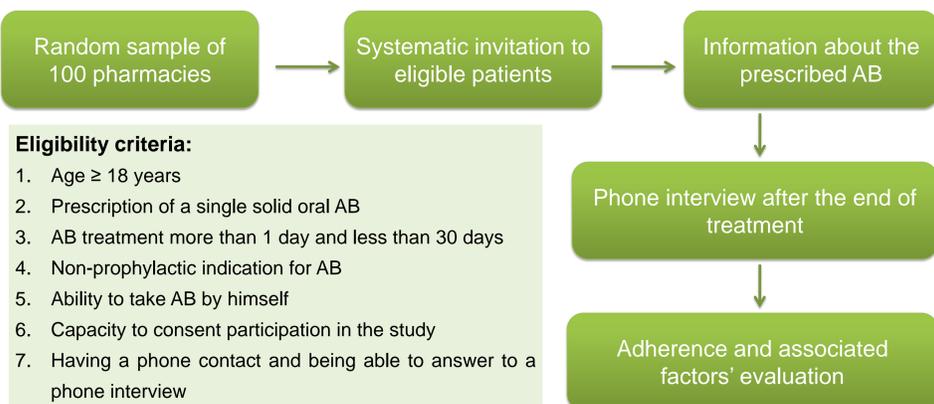
Introduction

Antibiotic (AB) resistance is associated to incorrect utilization and patient non-adherence to medication. In Portugal, global non-adherence to antibiotics was estimated to be of 40.7%¹ in 2000. Our study aims to:

1. quantify non-adherence to antibiotics in acute infectious diseases, at ambulatory level;
2. identify associated factors to non-adherence.

Methods

An observational prospective study was conducted during 2009's first semester.



Participants were classified as non-adherents if they answered positively or didn't answer to at least one question from the Morisky' scale:^{3,4}

1. Did you forget to take your AB?
2. Had you ever take your AB out of schedule? ----->
3. Did you sometimes stop taking your AB because you felt better?
4. Did you sometimes stop taking your AB because you felt worse?
5. Had you ever take more AB than the indicated by the physician?

Only considered if delay was >2 h for regimens 1x/day and >1h for other regimens⁵

Knowledge about the AB treatment – stop when feeling better, the consequences of an early stop (survival of bacteria) and decision of keeping the remaining AB was also evaluated.

Logistic regression model was used to identify associated factors to non-adherence (after descriptive and bivariate data analysis). All variables were individually tested and those with p-value<0.25 were entered in a stepwise logistic regression (backward direction with decision based on minimum AIC), using R software.

Results

In the 54 pharmacies 312 subjects were considered eligible. In 62 cases (19.9%) it wasn't possible to do the phone interview and, in this phase, 7 participants were excluded as they had stop the AB treatment by physician indication. A total of 243 participants was included (77.9%). Mean age was **46,5 ± 16,6 years**, and there were **182 (74,9%) females**. AB regimen characteristics are described in graphic and table 1.

For the non-adherence analysis, 2 (0.8%) individuals weren't considered because they haven't started AB due to "feeling better meanwhile". For the remaining 241, **non-adherence prevalence** was 24.5% (n=59, IC_{95%}[19.3; 30.5]%). Looking at each question of Morisky' scale individually we verify that 33 subjects *had forgotten to take the AB* (13.7%, IC_{95%}[9.7; 18.8]%), 31 *took AB out of schedule* (12.9%, IC_{95%}[9.0; 17.9]%), 6 *stop AB due to feeling better* (2.5%, IC_{95%}[0.0; 17.9]%), 4 *due to feeling worse* (1.7%, IC_{95%}[0.5; 4.5]%) e 2 *took more AB than indicated by the physician* (0.8%, IC_{95%}[0.1; 3.3]%).

Answers for **overall knowledge** are shown in graphic 2. Poor overall knowledge was observed for 79 (32.4%) participants, with no association with non-adherence (p-value = 0.693) in the bivariate analysis.

Variables included in the stepwise logistic regression (p-value<0.25) were age, marital state, difficulty to buy AB, AB class, frequency of intake, duration of treatment, usual medication, physician age and sex.

References

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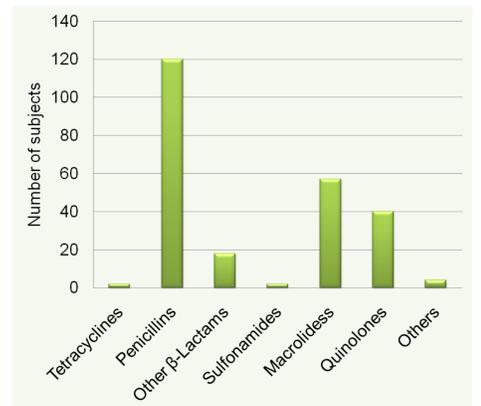
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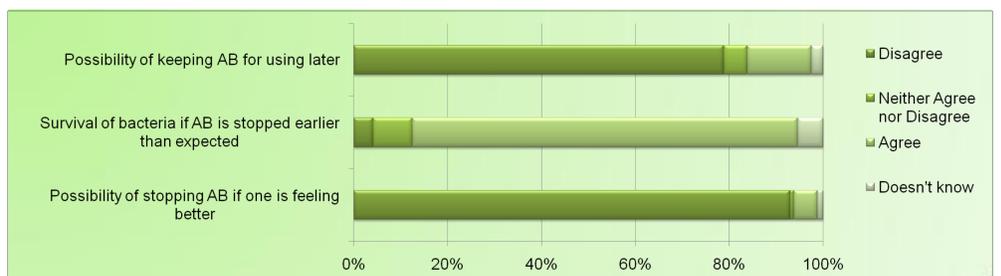
Results (continuation)

Characteristics	n (%)
Solid presentation	
Tablet/Capsule	241 (99.2%)
Other	2 (0.8%)
Number of units/intake	
1/intake	238 (98.8% from 241)
2/intake	3 (1.2% from 241)
Missing information	2
Frequency of daily intake	
1/day	58 (24.3% from 239)
2/day	157 (65.7% from 239)
>2/day	24 (10.0% from 239)
Missing information	4
Treatment duration	
Median	8 days
Mean (SD)	7.1 (2.7) days
Missing information	28

Table 1. (on the left) Characteristics of AB regimen for the included subjects: way of presentation, units by intake, frequency of intake and duration of treatment.



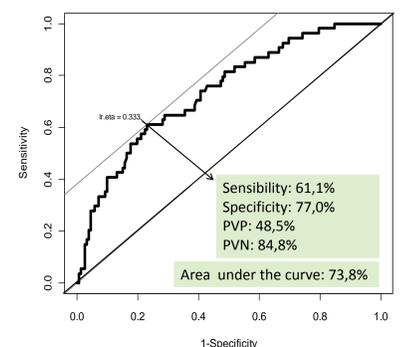
Graphic 1. (above) ATC3 (Anatomical Therapeutic Chemical Classification System – 3rd level) classification of the prescribed AB.



Graphic 2. (above) Subjects agreement with general sentences, reflecting knowledge about AB treatment.

Table 2. Logistic regression model, odds ratio estimates and confidence intervals (CI) for the included variables.

Variables	OR	CI95%
Age (continuous variable)	0.98	[0.95; 1.00]
Marital state (single)		
Married	1.26	[0.53; 3.00]
Divorced	1.94	[0.51; 7.47]
Widowed	1.37*10 ⁻⁷	[0.00; 0.00]
Difficulty to buy AB (yes)	1.78	[0.82; 3.85]
Frequency of intake (1/day)		
2/day	3.46	[1.23; 9.80]
> 2/day	2.77	[0.69; 11.10]
Physician sex (feminine)	2.40	[1.19; 4.85]
Physician age (<35 years)		
35-50 years	0.55	[0.19; 1.56]
>50 years	1.16	[0.40; 3.38]



Graphic 3. (above) ROC curve, sensibility, specificity, Predictive Value of Positive (PVP), and Predictive Value of Negative (PVN). The Hosmer-Lemeshow test didn't reject the hypothesis of a good adjustment of the model (p-value=0,56).

Conclusions

For the population evaluated on our study, non-adherence to antibiotics remains an **important problem** and seems to be mainly related with **forgetfulness** and **intake delays**. The overall knowledge regarding AB is good and with no association with non-adherence. On the other hand, several factors seem to affect non-adherence as a non-intentional behaviour. The most relevant' ones seem to be AB **frequency of intake** ≥2/day and the prescription of the AB by a **female physician**.

Further studies are requested, in order to compare this results with other evaluation' methods of non-adherence and to confirm the identified risk factors. Meanwhile, our study confirms that non-adherence is a complex behaviour, where AB regimen characteristics and patient-physician relationship have an important role. In order to improve adherence and prevent AB resistances, physicians should choose the simplest AB regimen possible and address, with the patient, ways of dealing with forgetfulness when prescribing.