QUANTITATIVE DETERMINATION OF DRUGS BY DIRECT AND INDIRECT METHODS: AN EXPERIMENTAL STUDY

Junqueira, C.A.[1,*]; Fröehlich; P.E.[1]

[1]Laboratório de Química Farmacêutica, Faculdade de Farmácia, UFRGS
***Mestrando – Início: 2010/4**

Introduction: Purity is one of the main attributes of quality of bulk drug materials, since the identification and quantitative determination of impurities and degradation products can help to avoid or at least control/minimize the risk of their contribution to the side effect profile of drug materials[1]. The role of assay methods, either specific or non-specific, in characterizing the quality of bulk drug materials, has been questioned[1,2]. On the other hand, the mass balance approach (100 – impurities%) has been considered as a more precise and accurate method[3]. Additionally, as a consequence of development in the methods for identification and quantitative determination the focal point of characterizing the quality of drug materials has shifted from assay methods to impurity tests[1,2].
Objective: To compare compendial assay methods with a mass balance approach in the determination of the active ingredient content and characterization of the quality of bulk drug materials.
Materials and Methods: The specific and non-specific compendial assays in the Farmacopéia Brasileira[4] and United States Pharmacopeia[5] will be critically evaluated and compared with a different approach of mass balance. Reference chemical substances from the Farmacopéia Brasileira will be used for this purpose. Only bulk drug materials will be dealt with, excluding from this study pharmaceutical formulations. The techniques to be employed in the indirect method include loss on drying, residue on ignition, water determination, and determination of organic impurities with HPLC-UV and GC-MS. The possibilities to calculate the active ingredient content from the results of assay and impurity tests will be investigated and compared. The results will be statistically treated with ANOVA. Finally, the roles of both approaches in characterizing the quality of bulk drug materials will be discussed.

References:
1. S. GÖRÖG. J. Pharm. Biomed. Anal. 48, 2008.
2. S. GÖRÖG. J. Pharm. Biomed. Anal. 36, 2005.
3. J. D. HOFER; B. A. OLSEN; E. C. RICKARD. J. Pharm. Biomed. Anal. 44, 2007.
4. F. BRAS. IV. Farmacopéia Brasileira, 4.ed. Atheneu: São Paulo, 1988.
5. USP. The United States Pharmacopeia. 30. Ed. Rockville: The United States Convention, 2007.
Acknowldgements: Financial support from CNPq/Brazil.