Therapeutic equivalence, efficacy and safety of epoetin alfa originator and biosimilar in the treatment of anemia in chronic kidney disease patients receiving dialysis

G. Busa[1], F. Tasca[1], G. Tonato[1], P. Lentini[2], R. Dell'Aquila[2]

[1]Dept. of Pharmacy, Ulss 3 Bassano del Grappa Hospital, Italy
[2]Dept. of Nephrology, Ulss 3 Bassano del Grappa Hospital, Italy

The European patents for epoetins recently expired and biosimilar versions of these products were placed in European and American markets. We are witnessing the second major revolution in the treatment of anemic dialysed patients with chronic kidney disease. In fact, the ability to stimulate erythropoiesis in the bone marrow by the use of therapeutic agents has only been possible in the last 20 years, with the development of the first recombinant human erythropoietin (epoetin), that was the first important revolution. The complexity of the processes required to produce medicinal products containing biotechnology-derived proteins and to characterize the physicochemical properties of these compounds has demanded, by EMA, the development of specific guidelines for approval of biosimilar products. The Marketing Authorisation dossier of biosimilar claiming to be similar to a reference medicinal product already authorised requires a full quality dossier including comparable clinical efficacy and safety data. As ever, a rigorous pharmacovigilance plan is required. Our goal was to determine if the therapy with different epoetins give the same benefits in terms of hemoglobin level stability in anemic dialysed patients with chronic kidney disease. We also evaluated the different weekly dose of the two drugs necessary to keep the HGB concentration into the recommended range. Other purpose was the biosimilar/originator safety considering ADRs. We utilized an hospital form (agreed between pharmacists and nephrologists) containing informations about patient (name, surname, sex, age, weight), pathology, drug (type of prescribed epoetin, dose and number of doses per week), blood markers (HGB, HCT) and iron administration numbers/month. We considered 63 patients, 26 females and 37 males, 64 ± 17 years old, in hemodialysis. The observation period was 24 weeks. The protocol consider three groups: 42 patients received originator (Eprex), 11 patients received biosimilar (Binocrit), 10 patients received in the first time the originator, and after the biosimilar drug. Mann-Whitney test demonstrated that, in the group1 and 2, we can't exclude the null hypotesis (the two treatments, originator and biosimilar, are equivalents) for hemoglobin level, hematocrit value and weekly dose. In a confidence interval (CI) at 95%, statistical significance (p) between the group of patients that was administered the originator epoetin and the biosimilar group, was 0,208 for the average hematocrit, 0,461 for the average levels of hemoglobin and 0,417 for the average weekly dose. Kruskal-Wallis test also confirmed that the difference between two treatments isn't statistically significant.The same type of analysis was performed in the group 3. The test compared the average weekly administration in the first period in which patients taking Eprex ® and in the second period in which the same patients took Binocrit ®. The same results were found. With the results obtained in the first analysis by the non-parametric test is not possible to exclude the hypothesis of equality of the two drugs, since the differences are not statistically significant; box-plot graphics shown a higher dose of biosimilar to get the same HGB levels of originator, but this data need additional validations.