Drug repositioning: is it always worth?

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Abstract

Drug repositioning is frequently associated with the serendipitous discovery of a novel therapeutic indication of an old active molecule for which the safety and efficacy profiles are well known to regulatory agencies and the scientific community. Consequently, the traditional process of drug discovery and authorization is sped up in comparison to so-called first-in-man drugs, reducing the costs required for preclinical studies, phase I and II clinical trials. On the contrary, other costs, including regulatory and phase III clinical trials, are generally comparable to those of new medicinal products. Repositioned drugs can reach the market in 3-12 years with a success rate five times higher than new compounds. The COVID-19 outbreak has also led to a rush to repurpose drugs: e.g., remdesivir, which was originally investigated for the Ebola virus, received conditional approval by the European Medicines Agency (EMA) in May 2020 for treating COVID-19 in adults and adolescents with pneumonia requiring supplemental oxygen.

Despite these undisputed advantages, the marketing of new repurposed medicinal products can be risky for a marketing authorization holder (MAH) especially when robust patent protection cannot be gained due to the available scientific knowledge and current clinical practice. This is the case of off-patent medicines, for which repositioning can be challenging due to the lack of economic incentives, and to the risk that successful clinical trials benefit competitors. In parallel, for several rare diseases, many repositioned drugs are commonly compounded in hospital pharmacies regardless of the availability of industrial products (e.g., amifampridine for treating Lambert-Eaton myasthenic syndrome, caffeine for infant apnoea, and ibuprofen for neonatal patent ductus arteriosus).

In these contexts, there is the need to assess properly the cost-effectiveness of repositioned products, considering also the MAH frequently receive significant financial/scientific support by public or no-profit organizations, to find a balance between the MAH economic sustainability and the patients' access to therapies.