MyHealthAvatar platform: matching real life patients with the generated virtual profiles from \textit{in silico} clinical trials

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\textbf{Objectives:} MyHealthAvatar (MHA) platform aims to a collaborative partnership among patients and healthcare providers [1]. Nowadays, in silico clinical trials (ISTCs), population pharmacokinetics, pharmacogenomics and information communication technologies have provided several tools towards stratified and personalized medicine approaches [2-4]. In this work a methodology of potential fitting of results generated through ISTCs with real life patients through virtual profiles of MHA is presented. To this respect, we use a simple example of discontinuation of warfarin administration during pre-operative period for a 55 year old male patient with a MHA profile.

\textbf{Methods:} MHA's architecture is based on integration of multiscale data gained from several sources (i.e. demographic, biomedical, genomics, lifestyle) and transform them into a representation of health status as a "virtual twin" or avatar [1]. The integration of these information from different avatars can lead in a creation of a virtual population profile (i.e. patients follow anti-coagulation treatment). The population pharmacokinetics in this example are based on the results from simulation of S-warfarin administration in a virtual population through Simcyp® population based simulator [5].

\textbf{Results:} The results from the Simcyp® simulations generated a PK/PD profile of S-warfarin during and after the discontinuation of the treatment in a virtual population with different characteristics regarding demographic, physiology and genomic data. The data output from MHA platform allow also the generation of a virtual cohort with characteristics regarding physiology, pharmacogenomics (i.e. CYP2C9 polymorphism). To this respect, the best fit of data between these two virtual profiles, e.g. based on patient's demographics and genomic information, finally leads in generation of information regarding our real-life patient (in this example, the 55 years old male) serving as additional information tool regarding the schedule of the operation.

\textbf{Conclusions:} MHA aims to serve as an innovative representation of the health status for citizens whereas for clinicians MHA potentially could support clinical decisions by extrapolating and/or fitting profiles with simulation models (i.e. population pharmacokinetics) and visual analytics [6]. The potential interconnection with in silico tools can provide novel approaches towards implementation of stratified and/or personalized medicine [7].

References:


\[\text{http://myhealthavatar.org/mha/}\]