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Procena zavisnosti između bioraspoloživosti i osobina molekula odabranih antihipertenziva

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Inhibitori enzima koji konvertuje angiotenzin (*ACEI*), blokatori kalcijumovih kanala (*CCB*) kao i antagonisti receptora angiotenzina II (*ARB*), predstavljaju danas često propisivane lekove koji imaju primenu u lečenju hipertenzije, odnosno povišenog krvnog pritiska. Cilj ovog rada bio je da se za dvadeset šest antihipertenzivnih lekova iz tri različite grupe, ACEI, CCB kao i ARB, proceni zavisnost između njihove bioraspoloživosti i fizičko-hemijskih osobina molekula. Za sve ispitivane lekove, primenom softverskih paketa izračunate su vrednosti deskriptora molekula: molekulska masa, volumen, polarna površina kao i različiti deskriptori lipofilnosti (logP vrednosti). Primenom proste linearne regresione analize dobijene su niske vrednosti koeficijenata korelacije ($R < 0,25$) za zavisnosti između podataka o bioraspoloživosti i izračunatih osobina molekula. U nastavku istraživanja, primenom višestruke regresione analize, ispitana je zavisnost bioraspoloživosti i lipofilnosti ispitivanih molekula uz primenu polarne površine, molekulske mase ili volumena kao nezavisno promenljive. Najbolja korelacija ($R = 0,70$) dobijena je primenom višestruke regresione analize između podataka o bioraspoloživosti, lipofilnosti i polarne površine odabranih molekula. Dobijeni rezultati ukazuju na značajnu zavisnost bioraspoloživosti odabranih antihipertenziva i osobina njihovih molekula, u prvom redu njihove lipofilnosti.

The evaluation of relationship between bioavailability and molecular properties of selected antihypertensive drugs

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Angiotensin-converting enzyme inhibitors (ACEI), calcium channel blockers (CCBs) as well as angiotensin II receptor antagonists or blockers (ARBs) are commonly prescribed antihypertensive drugs. The aim of this work was to investigate relationships between bioavailability and calculated molecular properties for twenty-six antihypertensive drugs from different groups, ACEI, CCBs and ARBs. With application of different software packages several molecular descriptors, polar surface area, molecular mass, volume and lipophilicity descriptors (log*P*) of selected antihypertensive drugs were calculated. Simple linear regression analysis showed the low correlation ($R < 0.25$) between bioavailability of selected drugs and their calculated molecular descriptors. Following, multiple linear regression analysis was applied to investigate further correlations between bioavailability, lipophilicity and polar surface area, molecular mass or volume as one additional independent variable. The best correlation ($R = 0.70$) was proven between bioavailability, lipophilicity and polar surface area as the independent variable. The results obtained indicate a important relationship between antihypertensive drugs bioavailability and their molecular properties on the first place their lipophilicity.

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