1.3.4 Propranolol toxicity

PRN toxicity results from the blockage of bronchial, cardiac and vascular β receptors. Patients with peripheral vascular insufficiency, diabetes, asthma, bradycardia and cardiac conduction diseases may suffer from PRN toxicity. Many patients experience PRN withdrawal syndrome after abrupt discontinuation, such as tachycardia, nervousness, increase of blood pressure, increased angina intensity, and myocardial infarction due to supersensitivity or up-regulation of β adrenoceptors (Katzung *et al.* 2004).

1.3.5 Propranolol adverse effects

PRN is a lipophilic drug that enters blood-brain barrier causing central nervous system adverse effects, such as vivid dreams, mild sedation, and rarely, depression. Furthermore, patients administered PRN experience coolness of hand and feet in winter, in addition some patients may experience sexual deficiency and symptomatic arterial hypotension (Katzung *et al.* 2004; Nkontchou *et al.* 2012).

1.3.6 Propranolol contraindications

PRN is contraindicated in severe bradycardia, high grade atrioventricular blockage and ventricular asystole in the presence of digitalis toxicity. It is also contraindicated in cardiogenic shock and severe depression (Craig and Stitzel 2004; Mansoor and Kaul 2009). PRN is used in extreme caution in severe bronchospasms in chronic obstructive pulmonary disease patients as well as moderate to severe persistent asthmatic patients since it blocks β_2 receptors in bronchial smooth muscle (Brunton *et al.* 2006; Chafin *et al.* 1999; Craig and Stitzel 2004; Mansoor and Kaul 2009).