Chapter 1

Introduction

A lot of observations have shown an increased incidence of postoperative acute renal failure in the patients with obstructive jaundice. (Dawson, 1968; Helwig and Schultz, 1932; Zollinger and Williams, 1956) The exact mechanisms, however, are poorly understocd, particularly the renal hemodynamic alterations during obstructive jaundice. Several mechanisms have been suggested to be responsible for this phenomenon, for example; the hypotension (Hishida et al., 1980; Mashford et al., 1962; Murray et al., 1958; Williams et al., 1960), cellular toxicity of bile acid (Palmer et al., 1962) and bilirubin (Baum et al., 1969), action of bile salt and the toxic effect of endotoxin from intestinal flora (Bailey, 1976; Bomzow et al., 1979). The hepatobiliary drainage system has been known to be the primary route for the elimination of bile products (Green et al., 1984). When this natural system is occluded, bile constituents overflow into the circulation. Under these circumstances, the kidney is assumed to be the major route of elimination bile products. The level of bilirubin does not correlate directly to the renal function. There is no significant relationship between the serum bilirubin level and the severity of renal failure (Bismuth et al., 1975; Epstein ,1984). Moreover, it is still not known which constituents of bile is responsible for the cellular toxicity during clinical cholemia. Bile salt can cause diuresis and natriuresis (Finestone et al., 1984).

There are many experimental models in many different species

animals for example, the common bile duct ligation(Better and Massry, 1972), common bile duct ligation with division (Chomdej et al., 1984; Dawson, 1964; Vital, 1982), choledochocaval shunt (Masumoto and Masuoka, 1980), and infusion of bilirubin or bile via either systemic circulation or intrarenal injection (Alon et al., 1982; Finestone et al., 1984). They lead to jaundice, disturbed liver function and if the procedures sufficiently prolonged, it will lead to the disturbance of the renal and cardiovascular system. In experimental animals, renal effects include a reduction and/or a rise and no change in renal blood flow, glomerular filtration rate (GFR) in the early stage (Levy and Finestone, 1983; Levy et al., 1983) and chronic stage, and disturbances in urinary sodium excretion. Therefore, based on these previous observations, the contention could be put forward suggestion that the relative importance of each change varies greatly from species to species and sometimes even within the same species. Furthermore, it has been demonstrated that urinary excretion of prostaglandin E_2 (PGE_2) which is the potent vasodilator was often increased (Zambraski and Dunn, 1984).

The purpose of the present studies is to determine the effects of biliary obstruction and indomethacin, a prostaglandin inhibitor on general circulation, renal hemodynamics and renal tubular functions in rats.