Chapter-Two

LITERATURE REVIEW
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The use of ultrasound and its interaction with biological tissues was investigated during 1930 but it picked up the application values only from 1950s. Its potentiality to interact with living tissues is mainly dependent on specific localised heating.

Ludwig (1950) reported the absorption and velocity of sound in tissues. During the same year Fry et al (1950) showed the non thermal effects of ultrasound in biological system. Pathological disorders in living systems were tried with therapeutic ultrasound as a curative method and Pohlman (1951) succeeded to some extent in explaining the mode of action.

De Forest (1952) presented the use of ultrasonic energy physical medium. Acoustic properties on the blood and its components were determined and reported by Carstensen and Schwan (1953). Wober (1956) emphasized the biological basis of ultrasound and its application in medium.

Fry (1958) indicated that ultrasound can be used for injuring or disrupting microorganisms and animal cells 'in-Vivo'. Diagnostic ultrasound also took a leap during sixtees. Holmes et al (1954) scanned the soft tissues
structure of human body with ultrasound. Taylor et.al (1961) employed ultrasound to diagnose intracranial space occupying lesions. Donald and Brown (1961) demonstrated tissue interfaces for the body using ultrasonic echosonography. Brown and Gordon (1967) explained that ultrasonic irradiation can be used on living tissues both for diagnosis and therapy. Three vital mechanism that are involved in interaction of sound waves with the biological tissues was explained by Dunn and Fry (1971). Pauly and Schwan (1971) exposed the liver to a continuous wave of ultrasound and reported a 3 different types of absorption level. Interaction of tumour tissues of ultrasound is reported by Johnson and Fry (1978).

Glick et.al (1979) exposed the skin, lung and peritoneal cells of mouse to a 2 MHz continuous wave of ultrasound at 1 W/cm\(^2\). They maintained the temperature at 34° and time of exposure between 100 and 200 seconds. Fredrick and Kremkau (1979) compiled and presented a review of ultrasound utilisation in cancer therapy. Deep seated tumours were heated by ultrasound induced local hyper-thermia by Lele (1980).

et al. (1981) reported the tissue damage as a result of micro bubbbular involvement when liver of mouse was exposed *in-Vivo* to ultrasound. Lele and Parker (1982) showed the temperature distribution of many tissues when local hyper thermia was induced by ultrasound. Marchal et al. (1982) avoided aqueous coupling medium and coupled the transducer directly on to the surface of human surfacial tumours. Tsuzaki (1984) irradiated the cultured mammalian cells *in-Vitro* with pulsed ultrasound. Necrosis of various grades and growth arrest in mouse breast tumour following low intensity and long time exposure was reported by kumar and Bhargava (1985). Ultrasound induced damages in liver tissues are reported when direct contact method was applied by Kumar and Raju (1988). Vasanthalakshmi (1988) showed irrivocable haemorrhagic changes in the kidney of a mouse when expose to ultrasound. Ultrasound and its influence on gonads is comparatively less worked out. O'Brien et al. (1979) reported the morphological changes in mouse testicular tissue when ultrasonic irradiation was done *in-Vivo*. Bailey et al. (1980) (1982) reported ultrasound induced damage to testis and ovaries of a mouse.