Ex No. 02

Study of Ultrasound Diathermy

AIM:-

- To study the working of Ultrasound Diathermy

THEORY:-

Ultrasound is sound above the limits of human hearing. The therapeutic effects of ultrasound result from the conversion of sound to heat energy. Ultrasound diathermy typically employs frequencies between 0.8 and 1 MHz.

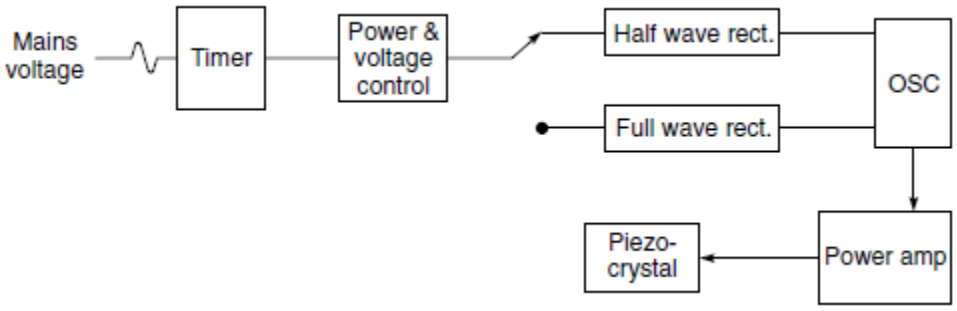
Ultrasound diathermy is considered a deep heating modality in that most absorption occurs far beneath the skin. It is most commonly used to treat tendonitis and bursitis, musculoskeletal pain, degenerative arthritis, and contractures. Maximal heating may be limited by deep tissue factors and not by skin tolerance. Ultrasound may be applied directly by placing the applicator on the skin, or indirectly by immersing the body part and applicator in a water-filled container.

Because of the importance of appropriate technique and inherent dangers, ultrasound diathermy should be applied by a trained attendant and the devices are not appropriate for unsupervised home use.

It's an electromagnetic wave different from sound waves. The frequencies of waves employed for medical purposes are between 5,00,000 and 3,000,000 cycles/sec.

GENERATION OF ULTRASONIC WAVES:

- Ultrasonic waves are generated by vibration of a Crystal mounted on a special head.
- Ultrasound provides therapeutic benefit via thermal (continuous ultrasound) and nonthermal (pulsed ultrasound) effects .



Block diagram of an ultrasonic therapy unit

CIRCUIT DESCRIPTION:-

The heart of the system is timed oscillator which produces the electrical oscillation of required frequency. The oscillator output is given to the power amplifier which derives the piezoelectric crystals to generate ultrasound waves. Power amplification is achieved by replacing the transistor in a typical LC tuned colpitt oscillator by 4 power transistors placed in a bridge configuration. The delivery of the ultrasounds power to a patient is to be done for a given time. This is controlled by incorporating a timer to switch on the circuit. The timer can be mechanically spring loaded type or an electronic one, allowing time settings from 0 to 30 minutes.

Procedure:

1. The required time and frequency are set for treatment.
2. The ultrasound crystal will be kept on the portion of body which has to be treated.

Result:-

The study of Ultrasound Diathermy working principle is studied.