Summary

Retrograde amnesia (RA) has extensively been studied to understand memory. The phenomenon of RA is interesting primarily because it indicates that memory changes after learning.

ECS has been shown to be accompanied by various physiological and chemical changes in the body. Interference of consolidation process (Duncan, 1949; Glickman, 1961; McGaugh, 1966; Patterson Lawler, and Rochester, 1978), fear associated with the treatment (Hayes, 1948; Coons and Miller, 1960), protein synthesis inhibition (McInnes et al., 1970; Cotman, Banker, Zornetzer and McGaugh, 1971; Agranoff, 1972) and various other biochemical changes occurring in CNS have been associated with the memory disorders after ECS. Changes in the levels of serotonin (Koto, Goszy, Roy and Grot, 1967; Essman, 1969; Stone, 1975), epinephrine (Lamprecht et al., 1974) and certain changes at β-adrenergic (Jensen et al., 1978; Messing et al., 1979; Keller and Bergstern, 1983) and dopaminergic receptors (Papeschi et al., 1974) have been held responsible for such amnestic phenomena. Recently endogenous opioids have also been reported to be involved in such memory modulating effects of ECS (Izquierdo et al., 1979, 1980). ECS causes an altered level of β-endorphin (Dias, Perry, Carrasco and Izquierdo, 1981) and met-enkephalin (Carrasco, Perry, Dias, Wofchuk and Izquierdo, 1982).
It is difficult to attribute the amnestic effects of ECS to any single factor. Whatever may be the actual cause of RA, its strength has been shown to be dependent on the duration of ECS (Alpern and McGaugh, 1968; Buckholtz and Bowman, 1972), training-treatment interval (Chorover and Schiller, 1965) and its intensity (Pagano et al., 1968; and Zornetzer and McGaugh, 1970).

Controlling other variables the present investigator was interested in studying the strength of retrograde amnesia as a result of ECS intensity. It was hypothesised that ECS causes RA, which is temporary in nature and is a direct function of strength of ECS.

A sample of 48 naive albino rats selected from the Animal House of Psychology Department of M.D. University. A single trial passive-avoidance task was used. Five groups were given ECS of 24, 35, 42, 54 and 60 mA and the last group was given no ECS. Retention tests were taken at an interval of 1, 2, 7, 14 and 30 days. Duncan's Range Test was employed to find out the statistical significance of differences between all the groups. All the groups differed significantly from control group at .05 level confirming the hypothesis that ECS causes retrograde amnesia. The latencies on the later retention test for every group differed significantly (at .05 level) from initial retention test, showing a recovery from
RA over repeated trials. The mean avoidance latencies of the low ECS group were found to be not significant from high ECS, but the recovery in low ECS groups has occurred quicker, compared to high ECS groups and these differences were found to be significant.

Thus the hypotheses have been confirmed that ECS causes RA, the recovery from which occurs over repeated retention tests, and the strength of RA is a function of ECS intensity.