

## PHYSICAL MORBIDITY WITH UNMODIFIED ECT - A DECADE OF EXPERIENCE

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### SUMMARY

*Recent recommendations for the routine use of modified ECT prompted an audit to be undertaken to determine the incidence of musculo-skeletal complications occurring in patients who received ECT at our centre from 1980 to 1990. Of the 13,597 treatments given, 98% were unmodified, due to the lack of availability of anaesthetists. Musculo-skeletal complications occurred in less than 1% of treatments and were of little clinical significance. However, modified ECT was associated with significantly greater frequency of potentially fatal complications such as cardiac arrest. The findings of this audit indicate that unmodified ECT administered by a trained team does not result in significant musculo-skeletal morbidity and may be preferable to modified ECT in the absence of trained anaesthetic personnel. The decision to routinely recommend modified ECT in developing countries should await scientific debate with due consideration of the complications, resources, ethics, practicality and cost as well as the consequences of such a recommendation on clinical practice.*

### INTRODUCTION

Current international recommendations for the practice of ECT include the routine use of modified ECT in the mandatory presence of a qualified anaesthetist (Freeman et al, 1989; American Psychiatric Association, 1990). However, unmodified ECT continues to be practiced at many centers in India (Agarwal et al, 1992), China (Fink, 1991) and perhaps other parts of the developing world due to unavailability of anaesthetists or other practical considerations.

Although unmodified ECT has frequently been condemned as being unethical and barbaric, it has also been considered safer than modified ECT where anaesthetic and resuscitative facilities are inadequate (Shukla, 1981). The complications considered specific to unmodified ECT are:

- (a) Fractures of the spine, femur, humerus, acetabulum and scapula
- (b) dislocations of the arm, jaw and hip
- (c) rupture of abdominal muscles
- (d) fat embolism
- (e) rupture or bleeding of internal organs or viscera
- (f) increased apprehension (Kalinowsky & Hippus, 1982).

On the other hand, ECT modified by anaesthesia and muscle relaxants increases the likelihood of bronchospasm, aspiration, cardiac arrhythmia and prolonged apnoea (Abramczuk & Rose, 1979; Shukla, 1981). Even with modified ECT, fractures or other complications supposedly specific to unmodified ECT can, and do, occur (Heshe & Roeder, 1976).

The Indian Psychiatric Society has no official recommendations to date on any aspect of the practice of ECT in the country. At the National Workshop on ECT held at NIMHANS in 1990, it was recommended after much debate that the Indian Psychiatric Society should consider adopting modified ECT in the presence of a qualified anaesthetist as the norm for clinical practice (Jain, 1992). This sentiment was echoed in a recent presidential address (Channabasavanna, 1992) with the additional recommendation that when the services of an anaesthetist cannot be obtained, ECT could be modified by psychiatrists with

relevant training in anaesthesia. If the above recommendations were to be officially endorsed by our society, many psychiatrists would be faced with the disquieting (and perhaps unethical) possibility of depriving their patients of a therapeutic method of proven efficacy or face official censure or even legal action. While the recommendation that ECT could be modified by psychiatrists with relevant anaesthetic training has its advocates (Pearlman et al, 1990), others consider it unethical to administer modified ECT in the absence of an anaesthetist (Prabhu, 1992). Complicating this already thorny issue is the fear that with the rapid growth of the consumer movement in the country, the use of ECT could be legally shackled due to injudicious clinical application (Channabasavanna, 1992).

It is therefore appropriate that an audit be conducted of the actual physical morbidity associated with unmodified ECT, compared to modified ECT, as is practiced in the country, to determine whether the routine use of modified ECT can be justifiably recommended.

From the inception of psychiatric services at this multidisciplinary teaching and referral hospital, ECT has been given predominantly unmodified due to the inability to spare anaesthetists for ECT after meeting existing surgical demands, as well as the belief that unmodified ECT is safe and considerably cheaper than the modified form. In view of the current debate regarding routine modification of ECT, we conducted a study of the frequency of clinically significant physical morbidity encountered among patients who received ECT over the past decade at our centre to determine whether we should alter our existing practice.

### MATERIAL AND METHODS

A retrospective analysis of the records of all patients who received ECT at the centre over the 11 years from 1st January 1980 to 31st December 1990 was conducted. Sociodemographic and clinical data were obtained from the case notes while details of ECT treatment and physical complications were recorded from the ECT treatment record, clinician's progress notes and, for inpatients, from nursing records also. The complications specifically looked for were musculo-skeletal problems arising during,

and attributable to, the course of ECT, cardiac arrests or deaths occurring in the first 24 hours of ECT, marked apprehension of ECT, discontinuation of ECT due to any cause and the reasons for doing so. In patients where orthopaedic or other specialists were consulted, the relevant case notes, radiographs or other investigations were also reviewed.

Unmodified ECT was administered thrice weekly by a trained team following the procedure recommended by Sargent and Slater (1972). The team consisted of four orderlies, three nurses, two postgraduate trainees and a consultant psychiatrist. The Siemens Konvulsator and Mecta JR ECT machines were used over the decade; both deliver brief pulse stimuli.

## RESULTS

Over the 11 years under study, 1835 of the 28,929 patients registered at our centre received ECT (6.3%). Of these 80 patients had more than one course of treatment during this period, the maximum being three courses. A total of 2002 treatment courses were given comprising of 13,597 individual treatments. Of these, only 332 treatments (2%) were modified by thiopentone and succinylcholine chloride which were administered in all instances by a consultant psychiatrist. The indications for modified ECT included the presence of fractures of long bones sustained during suicidal attempts or accidents, fracture of the spine or myalgia due to unmodified ECT, cervical laminectomy, recent abdominal surgery with a fresh scar and patient preference.

The patients treated ranged in age from 14 to 70 years. Thirty six percent of patients were between 20 and 30 years of age; the majority (59%) were between 20 and 40 years. Males comprised 56% of the patients treated.

Of the reported musculo skeletal complications with unmodified ECT, only fractures and myalgia were seen in our patients (Table 1). Twelve patients were diagnosed to have fractures following ECT ie, 0.09% of unmodified treatments. These usually occurred within the first four treatments. The majority were stable compression fractures of the thoracic vertebrae involving less than one third of the vertebral body in the collapse, and presented with pain which was either localized or referred anteriorly or present during respiration. None of these patients had any neurological deficit and were managed with bed rest and analgesics. Six patients (50%) continued to receive ECT, albeit modified. In all patients, the pain had subsided in 1 to 3 weeks. Ten of the twelve (88%) were followed up at our centre over a period ranging from 3 months to 8 years and none reported pain, disability or dysfunctions related to the fracture.

A further 63 patients (0.5% of unmodified treatments) complained of localized or generalized body aches following ECT. In 38 (60%) of them, x-rays were done to rule out fractures. These were normal in all cases. In the rest, check x-rays were clearly not indicated. The pain was usually transient and subsided with analgesics. Unmodified ECT was continued with uneventfully in 29

Table 1  
Physical Morbidity With Unmodified ECT

	FRACTURES	MYALGIA
No. of patients	12 (0.09%)	63 (0.5%)
Age range (Years)	18 - 59	17 - 70
Sex	M:F = 11:1	M:F = 55:8
Xrays done	12 (100%)	38 (60%)
ECT continued	6 (50%)	56 (88%)
Site	Vertebrae 11 (thoracic 10, lumbar 1) Scapula 1	Generalized 23 Back pain 40
Follow up		
a) No. of patients	10 (88%)	58 (92%)
b) Duration (months)	3 - 96	6 - 72

Morbidity more frequent among males ( $Z=5.49$ ,  $P<0.001$ )

Table 2  
Cardiac Arrests During ECT

	MODIFIED	UNMODIFIED
No. of treatments	332	13265
No. of arrests (%)*	3 (0.9%)	9 (0.07%)

\*more frequent with modified ECT ( $Z=3.603$ ;  $P<0.001$ )

(46%); 23 (37%) were given modified ECT for the rest of the course and 4 (6%) were given a few modified treatments with the rest of the course unmodified. In the remaining 7 (11%), ECT was stopped on clinical indications. Fifty eight (92%) of these sixty three patients were followed up for periods ranging from 6 months to 6 years and no persistent pain or disability was reported.

It was seen that with unmodified ECT, musculo skeletal complications (fractures and myalgia) were significantly more likely to occur in males, presumably due to more forceful muscle contractions.

Table 2 details the frequency of more serious complications occurring with ECT. Cardiac arrests during or immediately after treatment occurred in a little under 1% of all patients treated. However the frequency of this potentially fatal complication was significantly greater with modified as opposed to unmodified ECT. A 40 year old male with endogenous depression and no preexisting cardiac morbidity who arrested immediately after his third unmodified ECT could not be resuscitated. A postmortem did not reveal any cause of death, which was therefore attributed to a fatal arrhythmia. The mortality rate in our series of unmodified ECT was 0.05% of patients or 0.008% of treatments.

Fear or apprehension of ECT was reported by 150 patients who underwent unmodified ECT (7.5%). A fifth of them refused further ECT due to this fear while in the remainder the fear was reduced by sedative premedication enabling them to complete the course of ECT. In the earlier half of the decade under review, barbiturates, oral diazepam, parenteral haloperidol and even thiopentone were used to allay anxiety; in recent years, this has been

effectively managed by pretreatment with 1 to 4 mg of lorazepam given orally 1 to 2 hours earlier. Interestingly, it was observed that 27 of the 30 patients (90%) who refused ECT due to fear had not received any sedative premedication.

Unmodified ECT was given uneventfully to patients with coexisting physical morbidity of various types (ischemic heart disease, valvular heart disease, conduction defects; all trimesters of pregnancy; neurosyphilis; organic stupor and bronchial asthma). In some of these conditions, giving modified ECT might have been hazardous and would have required skilled management of anaesthesia.

### DISCUSSION

The main findings of this study are that:

(a) Unmodified ECT administered by an experienced and trained team is safe. Musculoskeletal complications occurred in less than 1% of treatments and were of little clinical significance.

(b) Fear of ECT can be minimized by the pre-treatment administration of oral benzodiazepines. Although the use of concurrent benzodiazepines has been reported to reduce the duration of the induced seizure and thereby its efficacy, it is our impression that this is no more likely, and perhaps less so, than with the use of the anaesthetic agent used in the modified procedure. Fear of ECT is not uncommon even in patients undergoing modified ECT; however the use of concurrent benzodiazepines in this context is likely to have a greater effect on the seizure threshold than with unmodified ECT.

(c) Complications of greater clinical significance such as cardiac arrests are significantly more common with modified ECT. Although our single mortality occurred in a patient administered unmodified ECT, this only indicates the failure of resuscitative techniques in the instance, rather than providing a true indication of the comparative potential for lethal outcomes between the two types of procedures. In our series, modified ECT resulted in significantly more frequent potentially fatal complications than unmodified treatments.

The implications of these findings are that the recommendation to routinely give only modified ECT requires further review. Although modified ECT is perhaps more aesthetically appealing to clinicians and segments of society and discussions regarding unmodified ECT give rise to emotionally charged reactions, the reality developing countries such as ours face is that there is a continuing lack of availability of anaesthetists in many psychiatric treatment facilities. Modified ECT is fraught with a higher incidence of potentially fatal complications as compared with unmodified ECT and even if psychiatrists were to receive relevant training in anaesthesia, their relative inexperience with resuscitation procedures may have serious consequences when emergencies arise. Providing training in preventing musculoskeletal complications is relatively more simple than training psychiatrists to assume the responsibilities of anaesthetists. Finally, unmodified ECT is cheaper and makes less demands on staff

time and is therefore of particular relevance to developing countries where the dictum that "every treatment is a matter of money as well as scientific judgement" (Blasingame, 1968) can seldom be forgotten.

We therefore recommend that this matter be subjected to further debate by psychiatrists and other members of the scientific community before final recommendations are made by the Indian Psychiatric Society. We also recommend that audits be conducted to ascertain the frequency of complications with modified ECT in centers where it is routinely given. Attempts to cost the two procedures as well as attempts to ascertain patients perceptions of the two methods would also be appropriate before recommendations are made. Our present conclusions are that the recommendation to routinely modify ECT is premature and perhaps inappropriate in this country.

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