TITLE: PSYCHOMOTOR RECOVERY AFTER DESFLURANE VERSUS ISOFLURANE IN OUTPATIENTS

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Desflurane (I-653) is a new volatile anesthetic which is less soluble than any of the currently available inhalation agents. Since less tissue accumulation should occur with desflurane, a more rapid recovery profile would be expected after outpatient anesthesia. We compared the emergence and recovery characteristics of desflurane and isoflurane when administered in combination with nitrous oxide (N_2O) for maintenance of general anesthesia.

34 healthy, consenting ASA I-II outpatients were randomly assigned to receive either isoflurane (Group I) or desflurane (Group II) according to an IRB-approved protocol. All patients were unpremedicated. Baseline visual analog scores were obtained to assess pain, sleepiness, tiredness, clumsiness, and fuzziness. In addition, standard psychometric tests (digit symbol substitution and Trieger tests) were performed. Anesthetic induction consisted of fentanyl 3 ug/kg iv, followed by thiopental 4 mg/kg iv, and succinylcholine 1.5 mg/kg iv. Group I patients received isoflurane 0.5-1% and N_2O 60%, while Group II patients received desflurane 2.5-3% and N_2O 60% for maintenance of anesthesia. The volatile agents were discontinued just prior to skin closure and N_2O was stopped after skin closure. The times that patients opened their eyes and followed commands were recorded. At 30, 60, and 90 minutes following entry into the PACU, the visual analog scales and psychometric tests were repeated. Continuous variables were analyzed using Student's t-test, $p<0.05$ was considered significant.

The two treatment groups were comparable with respect to demographic data and intraoperative variables. However, patients in Group II opened their eyes (5±2 vs 10±8 min) and were able to follow commands (6±2 vs 11±8 min, respectively) significantly earlier than those in Group I. Postoperatively, 12 of 17 patients in Group I were unable to perform the psychometric tests due to nausea, fatigue, or pain at 30 min. However, only 4 of 17 patients in Group II were unable to complete the same tests at 30 min. Changes in visual analog and digit-symbol substitution test scores are summarized in table 1. There were no differences between groups with regard to the Trieger test or discharge times.

In conclusion, desflurane appears to offer advantages over isoflurane with respect to recovery characteristics after outpatient anesthesia. Our results suggest that the use of desflurane is accompanied by a more rapid return to baseline cognitive function.

Table 1: Percent of baseline scores for two study groups.

	at 30 min		at 60 min		at 90 min	
	I	II	I	II	I	II
Pain	24	53	31	59*	32	60*
Sleepiness	45	64	46	74*	62	81
Tiredness	43	70	33	70*	47	89*
Clumsiness	38	66	49	65	57	80*
Fuzziness	42	69	47	66	56	75*
Symbols attempted	61	71*	51	74*	55	86*
Symbols matched	60	70*	50	75*	56	77*

* Significantly different from Group I, $p<0.05$

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TITLE: PERIOPERATIVE SUBSTANCE P (SP) LEVELS AND INCIDENCES OF PAIN, AND NAUSEA AND VOMITING (NV) WITH INHIBITION OF ACETYLCHOLINESTERASE

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Substance P (SP), a member of the tachykinin peptide family, is an undecapeptide. There are data indicating that SP-containing nerve afferents could participate in the transmission of pain. SP immunoreactive nerve fibers and varicosities have been identified in gastrointestinal (GIT), nervous, and other systems. Throughout the GIT, SP causes marked contraction of smooth muscle layers and stimulate intestinal secretions. Since acetylcholinesterase (ACHE) is concentrated in areas where SP may be released, it has been suggested that one physiological function of ACHE may be to hydrolyze SP, thus terminating its biological activity. Anti-ACHE drugs are frequently used to reverse the neuromuscular blockade (NMB) produced by muscle relaxants. We postulate that if ACHE has a role in the hydrolysis of SP; then, SP levels may be altered in patients who receive anti-ACHE drugs. Since SP is involved in the pathways that regulate GIT and pain there may also be variations in the incidence of pain, and NV in these patients. To our knowledge perioperative SP levels with and without anti-ACHE drugs have not been reported. Therefore we measured SP and noted the incidence of pain and NV in patients undergoing general anesthesia and receiving anti-ACHE drug.

METHODS: 19 adult unpremedicated patients (ASA PS 1; IRB approval & consent obtained) undergoing elective laparoscopic gynecological procedures were included in this study. A 16 gauge iv cannula was placed in one of the fore arm veins for blood collection. General anesthesia was induced with sodium pentothal (4-6 mg/kg) and atracurium (.5-.7 mg/kg), trachea was intubated, and anesthesia was maintained with 60% N2O and 1-2% isoflurane in O2. Before the end of surgery patients were randomly divided into two groups. Patients requiring reversal (neostigmine 2.5 mg + glycopyrrolate 0.6 mg iv) were assigned to group I and patients that recovered adequately from NMB were assigned to group II. Blood was collected for SP levels (radioimmuno assay) at the following times: [1] pre induction, [2] post induction, [3] maintenance, [4] end of anesthesia, and [5] recovery room (RR). Pain and NV were determined using a visual analogue scale in the RR. Data were analyzed using ANOVA (SP levels) and Chi-square test (pain and NV).

RESULTS & CONCLUSION: 3 of 10 (30%)in group I and 6 of 9 (66%) in group II had moderate to severe (MS) pain in the RR ($P = NS$). 4 of 10 (40%) patients in group I and 1 of 9 (11%) in group II had MS nausea and only 1 patient in group I had vomiting in the RR ($P = NS$).

In both groups, after induction and during maintenance SP levels decreased from preinduction levels ($P<.05$).

		SP levels (pg/ml) [1]	[2]	[3]	[4]	[5]
Group I	Mean	228	168	155	131	132
	SEM	35	35	38	27	34
Group II	Mean	100	87	66	107	131
	SEM	27	37	18	37	46

However, in group I SP levels remain decreased at the end of anesthesia and during recovery. Whereas,in group II SP levels increased at the end of anesthesia and during recovery when compared to maintenance levels ($P<.05$). Even though there is no statistical significant difference for pain and NV (because of the small numbers), it appears from our results that SP levels actually remain decreased after reversal with neostigmine and decreased SP levels seem to decrease the incidence of pain and nausea in the RR.

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