Use of Psychologic Testing in Characterizing the Frequent User of Ambulatory Health Care Services

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A familiar problem for the busy family physician is the frequent user of ambulatory health care services. Frequent users have been shown to represent a small proportion of the total health care population served but to secure a far larger share of services.[1-7] In an attempt to better characterize this type of patient, a modified case-control study was designed to determine whether frequent users could be identified by their scores on a screening instrument, the Millon Behavioral Health Inventory (MBHI).* It was hypothesized that the MBHI would successfully separate the frequent user (case) from the low user (control) and alert the primary care physician to plan therapeutic strategies most helpful in the management of the frequent user. The MBHI attempts to quantify into scales more narrowly defined attitudes that may either influence the course of the disease process or affect the way in which the individual attempts to cope with physical symptoms.[8,9]

*Available from Interpretive Scoring Systems, PO Box 1416, Minneapolis, MN 55440.

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Methods

The hypothesis was that frequent users (six or more visits per year) would have significantly higher scores than low users (one or two visits per year) on the inhibited, cooperative, and sensitive scales of the MBHI. This hypothesis was tested by administering the instrument to a randomly selected sample of frequent and low users who were patients in the Family Medicine Office Model (FMOM), an ambulatory health care unit staffed by 36 family medicine residents at St. Joseph's Hospital Health Care Center in Syracuse, New York.

Results

From July 1, 1979, to June 30, 1980, 2,840 patients made 6,918 visits to the FMOM. Nearly 30

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PHENERGAN® (Promethazine HCl) SYRUPS IN BRIEF:

Indications and Usage:

Temporary relief of coughs and/or upper respiratory symptoms associated with allergy or the common cold.

Contraindications:

Contraindicated in patients with hypersensitivity to any component. Promethazine is contraindicated in individuals hypersensitive or who have had an idiosyncratic reaction to it or to other phenothiazines.

Phenylephrine is contraindicated in patients with hypertension or with peripheral vascular insufficiency (ischemia may result with risk of gangrene or thrombosis of compromised vascular beds).

Avoid phenylephrine in patients hypersensitive to it or on a monoamine oxidase inhibitor (MAOI).

Antihistamines and codeine are both contraindicated in those with lower respiratory tract symptoms, including asthma.

Withhold dextromethorphan from patients on a MAOI.

Warnings

CODEINE: Dosage SHOULD NOT BE INCREASED if cough fails to respond, reevaluate unresponsive cough in 5 days or sooner for possible underlying pathology, e.g. foreign body or lower respiratory tract disease.

Codeine may cause or aggravate constipation.

Respiratory depression leading to arrest, coma, and death occurred with codeine antitussives in young children, particularly in the under-one-year infants whose ability to deactivate the drug is not fully developed.

Codeine may be accompanied by histamine release; use with caution in atopic children.

Head Injury and Increased Intracranial Pressure—The respiratory-depressant effects of narcotic analgesics and their capacity to elevate cerebrospinal fluid pressure may be markedly exaggerated in the presence of head injury, intracranial lesions, or preexisting increase in intracranial pressure. Narcotics may produce adverse reactions which may obscure the clinical course of patients with head injuries.

Asthma and Other Respiratory Conditions—Narcotic analgesics or cough suppressants, including codeine, should not be used in asthmatic patients (see "Contraindications"), nor in acute febrile illness with productive cough or in chronic respiratory disease where interference with ability to clear the tracheobronchial tree of secretions would have a deleterious effect on respiratory function.

Hypotensive Effect—Codeine may produce orthostatic hypotension in ambulatory patients.

PROMETHAZINE: May cause marked drowsiness. Caution ambulatory patients against driving or operating machinery until it is known that they do not become drowsy or dizzy from promethazine therapy.

The sedative action of promethazine is additive to the sedative effects of CNS depressants; therefore, agents such as alcohol, narcotic analgesics, sedatives, hypnotics, and tranquilizers should either be eliminated or given in reduced dosage in presence of promethazine. When given concomitantly with promethazine, reduce dose of barbiturates by at least ½, and the dose of analgesic depressants, e.g. morphine or meperidine, by ¼ to ½.

Promethazine may lower seizure threshold. Consider this when giving to persons with known seizure disorders or in combination with narcotics or local anesthetics which may also affect seizure threshold. Avoid sedative drugs or CNS depressants in patients with history of sleep apnea. Use antihistamines with caution in patients with narrow-angle glaucoma, stenosing peptic ulcer, pyloroduodenal obstruction, and urinary bladder obstruction due to symptomatic prostatic hypertrophy and narrowing of bladder neck.

Promethazine has been associated with cholestatic jaundice.

PHENYLEPHRINE: Because phenylephrine is adrenergic, give with caution to patients with thyroid diseases, diabetes mellitus, and heart diseases or those on tricyclic antidepressants.

Men with symptomatic, benign prostatic hypertrophy can experience urinary retention when given oral nasal decongestants.

Phenylephrine can decrease cardiac output. Use extreme caution when giving the drug, parenterally or orally, to patients with arteriosclerosis, to elderly individuals, and/or to patients with initially poor cerebral or coronary circulation.

Use with caution in patients on diet preparations, such as amphetamines or phenylpropanolamine, because synergistic adrenergic effects could result in serious hypertensive response and possible stroke.

DEXTROMETHORPHAN: May be accompanied by histamine release; use with caution in atopic children.

Precautions

Animal reproduction studies have not been conducted with these drug combinations. It is not known if they can cause fetal harm when given to pregnant women, or affect reproduction capacity. Give to pregnant women only if clearly needed.

GENERAL

Give narcotic analgesics, e.g. codeine, with caution and reduce initial dose in patients with acute abdominal conditions, convulsive disorders, significant hepatic or renal impairment, fever, hypothyroidism, Addison's disease, ulcerative colitis, prostatic hypertrophy, in patients with recent gastrointestinal or urinary tract surgery, and in the very young or elderly or debilitated.

Use promethazine cautiously in persons with cardiovascular disease or with impairment of liver function.

Use phenylephrine with caution in patients with cardiovascular disease, particularly hypertension.

Use dextromethorphan with caution in sedated patients, in the debilitated, and in patients confined to supine position.

INFORMATION FOR PATIENTS

All Phenergan Syrups may cause marked drowsiness or impair mental and/or physical abilities required for hazardous tasks, e.g. driving or operating machinery. Tell ambulatory patients to avoid such activities until it is known that they do not become drowsy or dizzy from Phenergan. Supervise children to avoid harm in bike riding or other hazardous activities. Concomitant use of alcohol or other CNS depressants, including narcotic analgesics, sedatives, hypnotics, and tranquilizers, may have an additive effect and should be avoided or their dosage reduced.

Advise patients to report any involuntary muscle movements or unusual sensitivity to sunlight.

Codeine may produce orthostatic hypotension in ambulatory patients; caution patients.

DRUG INTERACTIONS

CODEINE: In patients receiving MAOIs, an initial small test dose is advisable to allow observation of any excessive narcotic effects or MAOI interaction.

PROMETHAZINE: The sedative action is additive to sedative effects of other CNS depressants, e.g. alcohol, narcotic analgesics, sedatives, hypnotics, tricyclic antidepressants, and tranquilizers; therefore, these agents should be avoided or given in reduced dosage.

PHENYLEPHRINE

Drug	Effect
Phenylephrine with prior administration of MAOIs.	Cardiac pressor response potentiated. May cause acute hypertensive crisis.
Phenylephrine with tricyclic antidepressants.	Pressor response increased.
Phenylephrine with ergot alkaloids.	Excessive rise in blood pressure.
Phenylephrine with bronchodilator sympathomimetic agents and with epinephrine or other sympathomimetics.	Tachycardia or other arrhythmias may occur.
Phenylephrine with prior administration of propranolol or other β-adrenergic blockers.	Cardiostimulating effects blocked.
Phenylephrine with atropine sulfate.	Reflex bradycardia blocked; pressor response enhanced.
Phenylephrine with prior administration of phentolamine or other α-adrenergic blockers.	Pressor response decreased.
Phenylephrine with diet preparations, e.g. amphetamines or phenylpropanolamine.	Synergistic adrenergic response.

DRUG/LABORATORY TEST INTERACTIONS

Because narcotic analgesics may increase biliary tract pressure, with resultant increases in plasma amylase or lipase levels, determination of these enzyme levels may be unreliable for 24 hours after a narcotic analgesic has been given. These tests may be affected in patients on promethazine.

Pregnancy Tests

Diagnostic pregnancy tests based on immunological reactions between HCG and anti-HCG may result in false-negative or false-positive interpretations.

Glucose Tolerance Test

Increase in blood glucose has been reported in patients on promethazine.

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY

CODEINE, PROMETHAZINE, AND DEXTROMETHORPHAN

Long-term animal studies have not been performed to assess the carcinogenic potential of codeine or of promethazine or of dextromethorphan, nor are there other animal or human data concerning to show no evidence of carcinogenicity or mutagenicity in a variety of test systems, including the micronucleus and sperm abnormality assays and the *Salmonella* assay. Promethazine was nonmutagenic in the *Salmonella* test system of Ames.

PHENYLEPHRINE

A study which followed the development of cancer in 143,574 patients over a 4-year period indicated that in 11,981 patients who received phenylephrine (systemic or topical), there was no statistically significant association between the drug and cancer at any or all sites.

Long-term animal studies have not been performed to assess carcinogenic potential of phenylephrine, nor are there other animal or human data on mutagenicity.

A study of the effects of adrenergic drugs on ovum transport in rabbits indicated that treatment with phenylephrine did not alter incidence of pregnancy; the number of implantations was significantly reduced when high doses were used.

PREGNANCY

Teratogenic Effects—Pregnancy Category C

CODEINE: A study in rats and rabbits reported no teratogenic effect of codeine given in the period of organogenesis in doses ranging from 5 to 120 mg/kg. In the rat, doses at the 120-mg/kg level, in the toxic range for the adult animal, were associated with increase in embryo resorption at implantation. In another study a single 100-mg/kg dose in pregnant mice resulted in delayed ossification in offspring. There are no studies in humans; significance of these findings to humans, if any, is not known.

PROMETHAZINE: Teratogenic effects have not been demonstrated in rat-feeding studies at doses of 6.25 and 12.5 mg/kg of promethazine. These doses are 6 and 16.7 times the maximum recommended total daily dose of promethazine for a 50-kg subject depending on the indication for which the drug is prescribed. Specific studies to test the action of the drug on parturition, lactation, and development of the animal neonate were not done, but a general preliminary study in rats indicated no effect on these parameters. Although antihistamines, including promethazine, have been found to produce fetal mortality in rodents, the pharmacological effects of histamine in the rodent do not parallel those in man. There are no adequate and well-controlled studies of promethazine in pregnant women.

PHENYLEPHRINE: A study in rabbits indicated continued moderate overexposure to phenylephrine (3 mg/day) during the second half of pregnancy (22nd day of gestation to delivery) may contribute to perinatal wastage, prematurity, premature labor, and possibly fetal anomalies; when phenylephrine (3 mg/day) was given to rabbits during first half of pregnancy (3rd day after mating for 7 days), a significant number gave birth to litters of low birth weight. Another study showed that phenylephrine was associated with anomalies of aortic arch and with ventricular septal defect in the chick embryo. Phenergan® (promethazine HCl) Syrups should be used during pregnancy only if potential benefit justifies potential risk to the fetus.

Nonteratogenic Effects

Dependence has been reported in newborns whose mothers took opiates regularly during pregnancy. Withdrawal signs include irritability, excessive crying, tremors, hyperreflexia, fever, vomiting, and diarrhea. Signs usually appear during the first few days of life.

Promethazine taken within two weeks of delivery may inhibit platelet aggregation in newborn.

LABOR AND DELIVERY

Narcotic analgesics cross the placental barrier. The closer to delivery and the larger the dose used, the greater the possibility of respiratory depression in the newborn. Narcotic analgesics should be avoided during labor if delivery of a premature infant is anticipated. If the mother has received narcotic analgesics during labor, newborn infants should be observed closely for signs of respiratory depression. Resuscitation may be required (see "Overdosage"). The effect of codeine, if any, on the later growth, development, and functional maturation of the child is unknown. Administration of phenylephrine to patients in late pregnancy or labor may cause fetal anoxia or bradycardia by increasing contractility of the uterus and decreasing uterine blood flow.

NURSING MOTHERS

Some studies, but not others, have reported detectable amounts of codeine in breast milk. The levels are probably not clinically significant after usual therapeutic dosage. The possibility of clinically important amounts being excreted in breast milk in individuals abusing codeine should be considered. It is not known whether phenylephrine, promethazine or dextromethorphan is excreted in human milk. Caution should be exercised when any Phenergan Syrup is administered to a nursing woman.

PEDIATRIC USE

These products should not be used in children under 2 years of age because safety for such use has not been established.

Adverse Reactions

CODEINE

CNS—CNS depression, particularly respiratory depression, and to a lesser extent circulatory depression; light-headedness, dizziness, sedation, euphoria, dysphoria, headache, transient hallucination, disorientation, visual disturbances, and convulsions.

CV—Tachycardia, bradycardia, palpitation, faintness, syncope, orthostatic hypotension (common to narcotic analgesics).

GI—Nausea, vomiting, constipation, and biliary tract spasm. Patients with chronic ulcerative colitis may experience increased colonic motility; in patients with acute ulcerative colitis, toxic dilation has been reported.

GU—Oliguria, urinary retention, antidiuretic effect has been reported (common to narcotic analgesics).

Allergic—Infrequent pruritus, giant urticaria, angioneurotic edema, and laryngeal edema.

Other—Flushing of the face, sweating and pruritus (due to opiate-induced histamine release), weakness.

PROMETHAZINE

CNS—Sedation, sleepiness, occasional blurred vision, dryness of mouth, dizziness; rarely confusion, disorientation, and extrapyramidal symptoms such as oculogyric crisis, torticollis, and tongue protrusion (usually in association with parenteral injection or excessive dosage).

CV—Increased or decreased blood pressure.

Dermatologic—Rash, rarely photosensitivity.

Hematologic—Rarely leukopenia, thrombocytopenia; agranulocytosis (1 case).

GI—Nausea and vomiting.

PHENYLEPHRINE

CNS—Restlessness, anxiety, nervousness, and dizziness.

CV—Hypertension (see "Warnings").

Other—Precordial pain, respiratory distress, tremor, and weakness.

DEXTROMETHORPHAN

Occasionally causes slight drowsiness, dizziness, and GI disturbances.

Drug Abuse and Dependence

CONTROLLED SUBSTANCE

Phenergan with codeine and Phenergan VC with codeine are Schedule V Controlled Substances.

ABUSE

Codeine is known to be subject to abuse, however, abuse potential of oral codeine appears to be quite low. Even parenteral codeine does not appear to offer psychic effects sought by addicts to the same degree as heroin or morphine. However, codeine must be administered only under close supervision to patients with history of drug abuse or dependence.

DEPENDENCE

Psychological dependence, physical dependence, and tolerance are known to occur.

According to WHO Expert Committee on Drug Dependence, dextromethorphan could produce very slight psychic but no physical dependence.

Overdosage

CODEINE: Serious overdose with codeine is characterized by respiratory depression (decrease in respiratory rate and/or tidal volume, Cheyne-Stokes respiration, cyanosis), extreme somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin, and sometimes bradycardia and hypotension. The triad of coma, pinpoint pupils, and respiratory depression is strongly suggestive of opiate poisoning. In severe overdosage, particularly by the IV route, apnea, circulatory collapse, cardiac arrest, and death may occur. Promethazine is additive to depressant effects of codeine.

It is difficult to determine what constitutes a standard toxic or lethal dose. However, lethal oral dose of codeine in adults is reported to be in range of 0.5 to 1.0 gram. Infants and children are believed to be relatively more sensitive to opiates on body-weight basis. Elderly patients are also comparatively intolerant to opiates.

PROMETHAZINE: Signs and symptoms of overdosage range from mild CNS and cardiovascular depression to profound hypotension, respiratory depression, and unconsciousness.

Stimulation may be evident, especially in children and geriatric patients. Convulsions may rarely occur. A paradoxical reaction has been reported in children receiving single doses of 75 mg to 125 mg orally, characterized by hyperexcitability and nightmares.

Atropine-like signs and symptoms—dry mouth, fixed, dilated pupils, flushing, as well as GI symptoms, may occur.

PHENYLEPHRINE: Signs and symptoms of overdosage include hypertension, headache, convulsions, cerebral hemorrhage, and vomiting. Ventricular premature beats and short paroxysms of ventricular tachycardia may also occur. Headache may be a symptom of hypertension. Bradycardia may also be seen early in phenylephrine overdosage through stimulation of baroreceptors.

DEXTROMETHORPHAN

May produce central excitement and mental confusion. Very high doses may produce respiratory depression. One case of toxic psychosis (hyperactivity, marked visual and auditory hallucinations) after single dose of 20 tablets (300 mg) of dextromethorphan was reported.

TREATMENT

Treatment of overdosage with Phenergan Syrups is essentially symptomatic and supportive. Only in cases of extreme overdosage or individual sensitivity do vital signs including respiration, pulse, blood pressure, temperature, and EKG need to be monitored. Activated charcoal orally or by lavage may be given; or sodium or magnesium sulfate orally as a cathartic. Attention should be given to the reestablishment of adequate respiratory exchange through provision of a patent airway and institution of assisted or controlled ventilation.

The narcotic antagonist, naloxone HCl, may be given when significant respiratory depression occurs with the codeine syrups; any depressant effects of promethazine are not reversed by naloxone.

Diazepam may be used to control convulsions.

The antidotal efficacy of narcotic antagonists to dextromethorphan has not been established.

Avoid analeptics, which may cause convulsions. Acidosis and electrolyte losses should be corrected.

A rise in temperature or pulmonary complications may signal the need for institution of antibiotic therapy.

Severe hypotension usually responds to norepinephrine or phenylephrine. EPINEPHRINE SHOULD NOT BE USED, since in a patient with partial adrenergic blockade it may further lower blood pressure.

Limited experience with dialysis indicates that it is not helpful.

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percent of the visits were made by only 8 percent of the patients, those called frequent users, who averaged 8.5 visits during the year. Thirty-three women and five men completed the MBHI. The study analysis is restricted to the women so that sex would not be a confounding variable. Number of visits ranged from 1 to 20, with a mean of 6.3 (SD $\pm$ 4.5). Age of participants ranged from 25 to 65 years; education ranged from 6 to 16 years.

MBHI scores were analyzed by marital status, age, and distance from the FMOM to see whether any of these factors could be responsible for differences found between frequent and low users. No statistically significant differences existed except that persons nearer to the FMOM made more visits (analysis of variance, $P < .05$).

Differences appeared when frequent and low users were compared, and all differences were in the hypothesized direction. Frequent users tended to be more inhibited and sensitive than low users, but less sociable and respectful. They experienced more premorbid pessimism, social alienation, somatic anxiety, chronic tension, recent stress, and future despair. Statistically significant differences (Student's *t* test, $P < .05$) were found between the two groups in the inhibited, premorbid pessimism, and social alienation scales. The most striking finding was that 13 of 23 frequent users had their highest scores on the sensitive and inhibited scales, whereas none of 10 low users had this pattern.

Comment

Most of the data are consistent with previously identified[1,6,7,10] characteristics of frequent users. The results of this study suggest that the sensitive and inhibited scale scores describe more specifically the frequent user and may serve to differentiate this patient from the general medical population.

The concept that frequent users of health care services make up a clearly definable subset of the medical population is not new. The supposition that this group of patients can be further understood on the basis of personality type and coping styles is important conceptually, for it suggests that the reasons for frequent medical service use may be known and dealt with more effectively. The use of the MBHI to identify the patient at risk for frequent use of health care services may offer the family physician the opportunity to confront overutilization as a potential problem early in the relationship with the patient.

Encouraged by these results, a prospective study in a private family practice has been initiated to further test the relationship between MBHI scores and medical service utilization. Additional studies are planned to test intervention strategies designed to modify frequent use patterns in this group of patients. The psychologic dimension of illness behavior and help seeking is an important factor in overutilization problems, and it is hoped that the MBHI will shed further light on this group of difficult patients.

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