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# Tardive Dyskinesia: A Prevalence Study in an Outpatient Population

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# TARDIVE DYSKINESIA: A PREVALENCE STUDY IN AN OUTPATIENT POPULATION

by

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AN ABSTRACT OF THE THESIS OF

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TITLE: Tardive Dyskinesia: A Prevalence Study in an Outpatient Population

Major Professors: Dr. Gregory H. Frazer
Dr. John L. Echternach
Dr. Colin E. Box

The purpose of this prevalence study was to assess the occurrence of tardive dyskinesia among a chronically mentally ill sample of a suburban mental health clinic. The participants in this study were selected from clients of a suburban mental health clinic who agreed to participate in this prevalence study. There were 45 participants--17 males and 28 females.

The Abnormal Involuntary Movement Scale (AIMS) was selected as the instrument to measure the abnormal involuntary movements exhibited by the participants of the study on the day of testing. The testing occurred during a specific time period, June 8, 1987 to July 2, 1987. Inter-rater reliability for this prevalence study was assessed by comparing the ratings of 2 raters who were certified in this assessment technique. These 2 raters observed the same participants in the prevalence study simultaneously and independently recorded the abnormal involuntary movements according to a predetermined coding system.

Pooled variance t-tests were used to identify statistical differences with regard to sex, age, body site, and route of drug administration. Significant differences were identified for age and sex. This study reinforces the need for comprehensive, repeated testing among the chronically mentally ill for the presence and severity of tardive dyskinesia.

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# CHAPTER 1

## INTRODUCTION

According to Hayes (1983), in 1955, mental patients occupied approximately 50% of the hospital beds in the United States. Simple custodial care in mental hospitals, coupled with a variety of inconsistently effective and questionable humane practices including insulin shock, excessive seclusion, and high doses of barbiturates, were the primary modality of therapy for the management of patients with serious psychiatric illness.

The discovery of Thorazine in 1952 was considered a major pharmacological breakthrough. With the introduction of the antipsychotic drugs, such as Thorazine, the management of patients with serious psychiatric problems (i.e.: schizophrenia, manic-depressive illness, depression) changed drastically. Prior to these discoveries, there were no medications that specifically treated the symptoms of psychosis such as hallucinations, delusions, inappropriate behaviors, and disorganized thought processes (Taub, 1986). Although anti- psychotic drugs do not cure, they are able to decrease psychotic symptoms (Task Force on Late Neurological Effects of Antipsychotic Drugs, 1980). Antipsychotics may also be known as neuroleptics and refer to medications within the drug class of aliphatic phenothiazines. (See Appendix A.)

These antipsychotic drugs played a major role in deinstitutionalizing mental patients, allowing them to return to their communities and in many cases, lead productive lives. Notable changes occurred,

according to Jeste and Wyatt (1982), including a much-reduced prevalence of psychiatric hospitalization, the phasing out of many public mental institutions, the early return of hospitalized patients to home and work, the development of open psychiatric units in general hospitals, and an increased reliance on local community and outpatient treatment facilities.

Taub (1986) notes the past two decades have produced revolutionary changes in the practice of psychiatry and in the treatment of psychiatric patients and that antipsychotic drugs have played a major role in these changes. However, these powerful medications are not without risk. Consequently, the term neuroleptic, which is also used in reference to antipsychotic drugs, suggests that those medications may produce undesirable side effects on the central nervous system. One of the most serious side effects of neuroleptic drugs is tardive dyskinesia (TD).

"Tardive" refers to the fact that the condition usually develops after prolonged treatment of neuroleptics (6 months or more), although cases have occurred after much shorter periods of time. "Dyskinesia" refers to the involuntary movements that may affect the mouth, lips, tongue, arms, legs, or trunk (Taub, 1986). Generally, TD is neither obvious to the untrained observer nor to the patient with only a small percentage of patients experiencing the severe and disabling form of TD. Currently, Hayes (1983) states all neuroleptic medications may cause tardive dyskinesia. Many of the chronically mentally ill

will require a lifetime program of continuous medication management to combat these involuntary movements.

At this time, there is no effective treatment for tardive dyskinesia and the beneficial effects of the medication must be assessed against the possible development of tardive dyskinesia (Task Force on Late Neurological Effects of Antipsychotic Drugs (1980). With approximately 450 patients who are classified as chronically mentally ill being treated at a suburban mental health clinic and the majority of these patients seen at the clinic receive neuroleptic medication which has been shown to cause the abnormal involuntary movements of tardive dyskinesia. Therefore close monitoring and evaluation of these symptoms is of prime importance.

The prevalence of tardive dyskinesia is undetermined because no laboratory test is available to diagnose tardive dyskinesia and a lack of training of mental health professionals to identify the subtle movement disorders and taught to differentiate tardive dyskinesia movements from other movement disorders. Germer, Seraydarean, and McBrearty (1984) state that tardive dyskinesia is commonly found in 15 to 25 percent of patients being treated with neuroleptics; in up to 55 percent of the cases it develops within 3 years of continuous exposure to drugs. The disorder is persistent in at least one-third of all cases.

Tardive dyskinesia, as defined by the Department of Mental Health and Mental Retardation means a combination of abnormal involuntary

movements, permanent or transient, affecting the eyes, face, mouth, tongue, trunk or limbs associated with the use, usually long term, of antipsychotic medication.

## STATEMENT OF THE PROBLEM

With the discovery and usage of neuroleptics, the patients who are receiving these medications may contract tardive dyskinesia as a side effect of these medications. As there is no current cure for this disease, early diagnosis and treatment are imperative.

## PURPOSE OF THE STUDY

The purpose of the study was to assess the prevalence of tardive dyskinesia among a chronically mental ill sample of a suburban mental health clinic via the use of the Abnormal Involuntary Movement Scale.

## JUSTIFICATION FOR THE STUDY

This study provides a descriptive assessment of the occurrence of tardive dyskinesia in the chronically mentally ill patients who receive neuroleptic medications. With the possibility of severe consequences following onset, reliable estimates must be made to determine the urgency with which viable treatment protocols must be developed.

## ASSUMPTIONS

1. Assessment instrument (Abnormal Involuntary Movement Scale, AIMS) measures the symptoms of tardive dyskinesia (TD).

2. Specialized training and certification in AIMS assessment procedure qualifies the researcher to visually assess for tardive dyskinesia.
3. Patients being assessed do not hide symptoms.
4. Patients participated voluntarily and with full knowledge of the procedure.
5. AIMS instrument is reliable and valid.

DELIMITATIONS

1. The sample was secured from a specific population of chronically mentally ill patients.
2. Patients were tested during a 5 week time frame.
3. Patients were free from acute psychotic symptoms at the time of testing.
4. A modified form of the testing instrument was utilized.
5. Testing occurred in a common treatment room with no conscious change in the environment.

LIMITATIONS

1. The instrument for identifying and rating symptoms was developed to assess tardive dyskinesia.
2. Training to use this instrument was specific to chronically mentally ill.
3. Patients were assessed during regularly scheduled clinic visits.

4. Only patients agreeable to testing were assessed.
5. Symptoms of tardive dyskinesia may be transient. Only symptomology present during actual testing were assessed.

DEFINITIONS

1. Acetylcholine--is the neurotransmitter at the nerve endings of all pre-ganglionic autonomic nerves including the adrenal medulla, all postganglionic parasympathetic nerves, the postganglionic sympathetic nerves to sweat glands and vasodilatory blood vessels of the skeletal muscle and all skeletal neuromuscular junctions (Berkow, 1982, p. 2345).
2. Akathisia--is a subjective feeling of restlessness, and may include an inability to sit still, foot tapping, leg pounding, constant pacing and shifting of the weight while standing (Kalachnik, 1983, p. 15).
3. Antipsychotic/neuroleptic drugs--terms are used interchangeably; are used in the treatment of psychotic symptoms. These drugs normalize unacceptable psychotic behaviors such as hallucinations and delusions and decrease agitation, anxiety, irritability, and apprehensions (Haber, Leach, Schudy and Sideleau, 1982, p. 397).
4. Athetoid--wormlike movements, rhythmic, serpentine writhing movements (Kalachnik and Slaw, 1985, p. 3-4).
5. Axial hyperkinesia--excessive amount of mobility of head and trunk (Taber, 1963 p. A-102, H-55).

6. Depot drugs--injected neuroleptics--i.e. Prolixin Decanoate, Haldol (Morgenstern, Glazer, Gibowski and Holmberg, 1986, p. 324).
7. Dopamine--may function as a neurotransmitter in certain areas of the brain and in certain peripheral vascular beds (Berkow, 1982, p. 2345).
8. Dystonia--is characterized by sustained contractions of skeletal muscles with relaxation of an opposing group of muscles (Kalachnik, 1983, p. 15).
9. Involuntary movements--in tardive dyskinesia is manifested movements usually of choreoathetotic or dystonic type (Task Force on Late Neurological Effects of Antipsychotic Drugs, 1980, p. 1163).
10. Manic-depressive disorder--a major affective disorder characterized by severe mood swings and a tendency to remission and recurrence (Frazier, Campbell, Marshall and Werner, 1975, p. 99).
11. Myokymic--lateral and trembling movements, jerky movements (Kalachnik and Slaw, 1985, p. 3).
12. Nigrostriatal system--is part of the basal ganglia which refers to the subcortical gray masses at the base of the cerebral hemisphere. The basal ganglia, in turn, is part of the extrapyramidal motor system which responsible for the static postural activities, motor integration, and inhibition of involuntary movements (Kalachnik and Slaw, 1985, p. 8).

13. Parkinsonism or pseudoparkinsonism--is characterized by lack of movement, cogwheel rigidity, resting tremor, pill rolling, mask-like or expressionless face, drooling, infrequent blinking and shuffling gait (Kalachnik, 1983, p. 15).
14. Retrocollis--a spasm of posterior muscles of the neck (Taber, 1963, p. R-27).
15. Schizophrenia--a group of disorders, usually of psychotic proportion, manifested by disturbances of thought, mood, and behavior (Frazier et al., 1975, p. 136).
16. Sterotyped behavior--persistent mechanical repetition of speech or motor activity, commonly seen in schizophrenia (Haber et al., 1982, p. 397).
17. Tardive dyskinesia--a combination of abnormal involuntary movements, permanent or transient, affecting the face, eyes, mouth, tongue, trunk, and/or limbs associated with the use, usually long term of neuroleptic medication (Kalachnik and Slaw, 1985, p. 3).

## CHAPTER 2

## REVIEW OF LITERATURE

This chapter will provide a historical review of the literature regarding tardive dyskinesia. Because the symptoms of tardive dyskinesia tend to wax and wane from day to day, many studies that have been done on this subject tend to contradict each other and/or are inconclusive.

With approximately 4,200 people screened for mental health issues in this city last year, approximately 450 are seen in this suburban mental health clinic. With the majority of the chronically mentally ill being seen at the clinic receiving neuroleptic medication which have been shown to cause the abnormal involuntary movements of tardive dyskinesia, close monitoring and evaluation of these symptoms is of prime importance.

### HISTORY

Discovery of antipsychotic drugs, according to Hayes (1983), improved care for patients with schizophrenia and other psychiatric disorders, both in controlling acute symptoms and preventing recurrence. Although antipsychotic drugs do not offer a cure, their effectiveness in ameliorating psychotic symptoms is well established (Hayes, 1983). The major uses for antipsychotic medications, also known as neuroleptics, are in the management of schizophrenia, organic brain syndrome, with psychosis, and the manic phase of manic-depressive illness. These patients receive antipsychotic medications to control their floridly psychotic symptoms and these patients may require a lifetime program

of continuous medication management (Hayes, 1983). But this advance has been marred by the occurrence of tardive dyskinesia (TD). Tardive dyskinesia as described by Tarsy and Baldessarini (1984), is an involuntary movement disorder associated with the prolonged use of antipsychotic medications. Currently, all of the antipsychotic medications used in the United States can produce unwanted neurological effects, hence the term neuroleptic is often applied to this class of drugs (Task Force on Late Neurological Effects of Antipsychotic Drugs, 1980).

According to Burke (1984), it is uncertain whether any particular drug is more or less likely to induce tardive dyskinesia. Information regarding a patient's prior treatment with antipsychotic medications is often incomplete and generally, several drugs have often been used.

Simpson, Pi, and Sramek, (1986) state that lower potency neuroleptics have also been reported to pose a greater risk for tardive dyskinesia. In a study by Munyon, Salo, and Briones, (1987), the data indicated that tardive dyskinesia would be more commonly associated with the use of low potency neuroleptics than with high potency drugs. Gee and Mesord (1979), found no conclusive evidence that tardive dyskinesia was associated more frequently with any particular neuroleptic agent. Thus the data from the available literature does not allow a definitive conclusion to be reached on the relationship of either drug type or dosage and tardive dyskinesia (Munyon et al. (1987).

Morgenstern et al. (1987) noted in their study that there were

conflicting reports whether depot neuroleptics increased the risk of tardive dyskinesia. Patients treated with depot drugs nearly always receive their prescribed dose, while there is no assurance with oral drugs. Also, there is a variation among patients in drug metabolism between orally and parentally administered drugs.

Few psychiatric patients are treated with a single neuroleptic over the years, consequently it may be impossible to decide which neuroleptic caused the dyskinesia. Compounding the problem, the time of onset of the dyskinesia in individual patients is therefore uncertain (Jeste and Wyatt, 1982).

According to Taub (1986), the incidence of tardive dyskinesia may vary with the patient's age, sex, psychiatric diagnosis, drug dosage, length of drug treatment, and other factors unknown at present. The course of tardive dyskinesia is difficult to predict in individual patients. Currently, there is no satisfactory or effective treatment for tardive dyskinesia. Although no known cure exists for tardive dyskinesia, ironically, the administration of the same neuroleptic drugs that produced the symptoms can remove them (Taub, 1986). Continued administration of neuroleptics after detection of tardive dyskinesia does not appear to aggravate the disease but may cause an otherwise temporary dyskinesia to become irreversible (Taub, 1986). At the present time, the best available means to deal with the problem of tardive dyskinesia is the use of conservative but effective dosage regimens of neuroleptics for clear-cut indications (continuing objective

evidence of psychosis and of responsiveness to treatment) (Task Force on Late Neurological Effects of Antipsychotic Drugs, 1980).

## SIDE EFFECTS

Kalachnik (1984) lists side effects of neuroleptics to include the following:

> lethargy, dry mouth, constipation, weight gain, photosensitivity, excessive sweating, and extrapyramidal effects. Extrapyramidal side-effects consists of 4 main conditions: 1. Akathisia, which is characterized by a subjective feeling of restlessness; 2. Dystonia, which is characterized by sustained contractions of skeletal muscles with relaxation of an opposing group of muscles; 3. Drug-induced parkinsonism or pseudoparkinsonism, which is characterized by lack of movement, cogwheel rigidity, resting tremor, pill-rolling and loss of postural reflexes; 4. Tardive dyskinesia, characterized by a variable mix of involuntary movements of the face, mouth, tongue, upper limbs, and lower limbs. (p. 15)

## DEFINITION

According to Kalachnik and Slaw (1985) tardive dyskinesia is generally defined as "a variable combination of abnormal involuntary movements, permanent or transient, affecting the face, eyes, mouth, tongue, trunk and/or limbs associated with the use, usually long-term, of neuroleptic medication" (p. 3).

SPECIFIC MOVEMENTS

Specific movements as listed by Kalachnik and Slaw (1985):

1. In the facial area, movements such as grimacing, tics and brow arching may occur.
2. In the ocular area, bursts of blinking as well as fine tremor or twitching of the eyelids or periorbital area may occur.
3. In the oral area, movements such as lip smacking, puckering, sucking, chewing, lateral jaw movement, lower lip thrusting, and cheek puffing may occur.
4. In the lingual area, movements such as tongue thrusting, a hanging flaccid tongue against the cheek or lip producing a noticeable bulge. Wormlike (athetoid), jerky (myokymic), lateral, and tremoring movements of the tongue inside the mouth may also occur.
5. In the head, neck, and truncal areas, shoulder torsion or rotation, a thrusting or circulatory movement of the pelvic area, and snapping of the head back or to the side may occur.
6. In the upper limb area, the arms, hands, and/or fingers may display jerky movements (myokymic) and/or rhythmic serpentive writhing movements (athetoid).
7. In the lower limb area, movements such as toe movement, foot tapping, and ankle flexion may occur. (p. 3)

## BIOCHEMICAL THEORY

The mechanism by which antipsychotic drugs relieve symptoms of psychotic illness is thought to be due to the ability of these drugs to selectively block the neurotransmitter dopamine at postsynaptic receptor sites in the brain. Tardive dyskinesia is believed to be a consequence of chronic postsynoptic dopamine receptor site blockade in the nigrostriatal motor portion of the brain. A supersensitive dopamine receptor produces neurological symptoms of increased dopamine and excessive receptor activity (Hayes, 1983).

A paradoxical finding by Barnes, Kidger, and Gore, (1983), showed at very high drug doses even maximial dopamine receptor supersensitivity maybe effectively blocked and tardive dyskinesia movements may thus be suppressed. A plausible interpretation of these results is that the post-synaptic dopamine receptor supersensitivity response, considered to be the pathophysiological basis of the condition, can be overwhelmed at high drug concentrations.

Jeste and Wyatt (1982) state that one theory of tardive dyskinesia is that this syndrome is associated with nigrostriatal dopamine-acetylcholine imbalance, with relative underactivity of the cholinergic system. The most convincing clinical evidence in favor of this hypothesis has been the aggravation of tardive dyskinesia by antiparkinsonian agents, which are commonly used to treat or even prevent neuroleptic-induced parkinsonism.

Researchers are attempting to discover effective antipsychotic drugs that are more specific dopamine blockers (Hayes, 1983). Since

dopaminirgic influence is predominiant, therapy is directed toward decreasing dopaminirgic activity or increasing cholinergic activity (Johnston, Coleman, Calloway, May and Druff, 1980).

## DIAGNOSING TARDIVE DYSKINESIA

According to Taub (1986), the lack of an objective method of diagnosing tardive dyskinesia makes the prevalence difficult to determine. The diagnosis is based solely on the patients physical symptoms, which may fluctuate and which maybe rated differently by different observers. Diagnosis is further complicated by the fact that the symptoms of tardive dyskinesia overlap with those of many other neurological disorders. There are also many conditions that produce abnormal movements that can be confused with tardive dyskinesia. Kalachnik (1985), lists the following conditions: Huntington's Chorea, Sydenhamj's Chorea, Gilles de la Taurette's syndrome, advanced age, cerebral palsy, stereotypic or self-stimulatory movements of schizophrenia or developmental disability, drug intoxication, loose dentures, no teeth, and other extra-pyrimidal side effects of neuroleptic use.

Jeste and Wyatt (1982) list a number of factors which contribute to problems in differential diagnosis of tardive dyskinesia are as follows:

1. There is no clinical or laboratory test that will establish or rule out tardive dyskinesia.
2. Gradual and painless evolution of the symptoms makes it difficult to date the onset of dyskinesia.

3. The patients themselves are often unaware of the dyskinesia.
4. The severity of symptoms tends to fluctuate over a period of time.
5. Nondyskinetic movements such as mannerisms, tics, and drug-induced parkinsonism frequently coexist along with tardive dyskinesia in the same patient.
6. It may not always be easy to separate the contribution of neuroleptics to the production of oral dyskinesias from the contribution of other conditions, such as ill-fitting dentures.
7. The physician may be unaware of the long-term use of amphetamines or antihistamine drugs by the patient. These drugs are known to produce dyskinesia too. (p. 58)

According to Kalachnik and Slaw (1985), three prerequisites must be met before tardive dyskinesia can be considered and diagnosed:

1. At least 90 days of cumulative neuroleptic exposure.
2. Abnormal involuntary movements of at least a "moderate" score in one body area or at least two "mild" scores in two different body areas using standardized rating scale and examination procedure.
3. The absence or elimination of other conditions as the reason for abnormal movements. (p. 13)

Kalachnik and Slaw (1985) list six possible types of tardive dyskinesia once the 3 prerequisites are met:

1. Probable T.D.: the patient meets the 3 prerequisites at one point in time.
2. Masked Probable T.D.: the patient meets the criteria for Probable T.D. at one point in time. However, within 2 weeks of a neuroleptic dosage increase or reinstitution occurring within 3 months of the Probable T.D. examination date, movements no longer meet the severity level of Prerequisite 2.
3. Transient T.D.: the patient meets the criteria level for Probable T.D. at one point in time. However, on re-examination within 3 months and given no neuroleptic dosage increase or reinstituion movements no longer meet the severity level of Prerequisite 2. Neuroleptic dosage decreases may even have occurred during the period between examinations.
4. Withdrawal T.D.: the patient first meets the severity level of Prerequisite 2 within 2 weeks of neuroleptic discontinuation (within 5 weeks for long-acting drugs such as fluphenazine decanoate). However, within 12 weeks after discontinuation movements dissipate and no longer meet the severity level of Prerequisite 2.
5. Persistent T.D.: the patient meets the criteria for Probable T.D. and continues to do so for 3 months or greater.
6. Masked Persistent T.D.: the patient has met the criteria for Persistent T.D., but within 3 weeks of a neuroleptic dosage increase or reinstitution, movements no longer meet the severity level of Prerequisite 2. (p. 13 & 14)

The risk that long-term administration of antipsychotic drugs will cause tardive dyskinesia does not lessen the physician's responsibility to prescribe them in appropriate situations. That obligation exists not only because of the physician's overriding moral, ethical, and legal responsibilties to provide the best of care to the patient, but also because the failure of a physician to control aggressive or assaultive behavior of a patient under his or her care, can be itself subject the physician to malpractice or other legal liability (Freishtat and Einhorn, 1981). Continuation of the neuroleptic must be repeatedly assessed and documented (Simpson et al. 1986).

RECENT FINDINGS

Burke (1984) states that some patient groups seem especially likely to develop tardive dyskinesia. At older ages, more women seem to be affected by tardive dyskinesia than men, and the older women seem to develop the more serious or severe form of tardive dyskinesia.

It was also noted by Wolf, DeWolfe, Ryan, Lips, and Mosnaim, (1985) that alcoholism was related to tardive dyskinesia in the affective disordered patients. Alcohol may cause organic impairment that could aggravate the neuroleptic-induced changes in the central nervous system.

The practice of using more than one antipsychotic drug is still common. Hayes (1983) states that giving more than one antipsychotic drug for the same purpose often complicates the clinical picture,

produces a broader range of unwanted effects, and offers no additional therapeutic advantages. Hayes (1983) feels that a rational approach to treatment is to use an adequate dose of one antipsychotic drug instead of subtherapeutic doses of 2 drugs.

According to Taub (1986), several studies have reported the retarded to have an increased risk of developing tardive dyskinesia. Many of the retarded have underlying organic or movement disorders that increase the risk of their developing tardive dyskinesia.

Jeste and Wyatt (1982) suggest that anticholinergic agents may not only aggravate preexisting dyskinesia, but may also predispose the development of tardive dyskinesia in individuals receiving neuroleptics. Although worsening of tardive dyskinesia with anticholinergic medication is well documented, there is as yet no convincing evidence to indicate that these drugs predispose one to tardive dyskinesia.

Casey, Gerlach, and Bjorndal (1982) reported limited support effects of levadopa occurring in younger patients not concurrently receiving neuroleptic treatment. That study also reported elderly patients and those receiving neuroleptic drugs were much less likely to benefit from treatment of levadopa.

Preliminary studies done by Schrodt, Wright, Simpson, Moore, and Chase (1982), found no short-term dose-dependent effect of propranolol on tardive dyskinesia. Future studies need to allow adequate time for detection of long-term propranolol use.

According to Nishikawa, Tanaka, Koga, and Uchida (1983) combining neuroleptics with clonidine was more superior for controlling tardive

dyskinesia, but more research needed to be done.

Casey and Toenniessen (1983) state that a strategy which successfully manages two chronic illnesses must be adopted: psychosis on one hand and tardive dyskinesia on the other and whatever treatment intervention is initiated for one illness will generally have an impact on the other syndrome.

In a study by Yassa, Ananth, Cordozo, and Alley, (1986), the effect of smoking on tardive dyskinesia was studied. This study suggests that smoking a pack of cigarettes every 2 days is a risk factor in tardive dyskinesia but smoking larger quantities does not seem to increase the risk.

Gardos, Cole, Schniebolk, and Salamon (1987) note that the dyskinetic movements may interfere with everyday activities. Severe involuntary movements can interfere with swallowing and cause muffled speech, abnormal gaits, and irregular respiration. When several of these complications occur in a patient, an unusually serious or life-threatening illness may result.

## ASSESSMENT TECHNIQUES

Assessment and monitoring to provide early detection and prevention of tardive dyskinesia becomes of primary importance. Currently there are 7 scales which may be used to measure movements in patients as listed by Kalachnik and Slaw (1985). They are:

1. Abnormal Involuntary Movement Scale (AIMS); 2. Abbreviated Dyskinesia Scale (ADS); 3. Dyskinesia Identification System-Coldwater (DISCO); 4. Dyskinesia Identification System-Condensed Users

Scale (DISCUS); 5. Simpson Tardive Dyskinesia Rating Scale (TDRS); 6. Smith-Texas Research Institute of Mental Sciences Dyskinesia SCale (TRIMS); 7. Withdrawal Emergent Symtoms Checklist (WES or WESC). (p. 17)

Kalachnik (1983) states that a rating scale approach to monitoring for tardive dyskinesia is most realistic. Several aspects of monitoring are important. Dyskinesia movements may wax and wane over time and shift from one body area to another. Two ratings are needed to establish a baseline range against which future scores may be compared. Movements may vary according to time of day or as a function of stress. Activation tasks should be used to elicit movements. An assessment instrument does not diagnose tardive dyskinesia but merely provides a quantitative measure which must be evaluated within the context of a milieu of variables.

To establish regular systematic monitoring with an assessment instrument, it is necessary to have training to have rater accuracy. The Abnormal Involuntary Movement Scale (AIMS) was chosen. This assessment instrument, developed by the psychopharmacology research branch of the National Institute of Mental Health, was selected for the physical measurement and clinical quantification of tardive dyskinesia. This examination identifies the subtle movement disorders which the assessor is trained to observe for. This examination generally takes approximately 10 minutes and should be done twice a year. The Abnormal Involuntary Movement Scale evaluation is also recommended in routine patient physical examinations to monitor the course of symptomology

over an extended period of time (Germer et al. 1984). A system of collecting data and establishing guidelines from which to make rational decisions with regard to clinical managment and ultimately have the patient on the lowest therapeutic dose of antipsychotic medication which will control the symptoms.

## CONCLUSION

With the advent of antipsychotic/neuroleptic medications, a large percentage of the chronically mentally ill were freed from the confines of institutions and psychiatric hospitals. Along with this new found freedom came the discovery of abnormal involuntary movements which may be a side-effect of neuroleptic medication. Since all the currently used neuroleptics in the United States have the same predisposition to cause tardive dyskinesia, these medications need to be used judiciously. The lowest effective dose range of neuroleptics needs to be prescribed for the appropriate psychiatric symptoms to minimize the occurrence of tardive dyskinesia. The earlier the detection of these abnormal involuntary movements of tardive dyskinesia, the better the prognosis will be. Systematic monitoring, using one of several instruments, such as the AIMS, is important for early detection or screening measure.

As the number of chronically mentally ill who received neuroleptic medications increases, the importance of routine monitoring and assessment of any abnormal involuntary movements becomes critical. Early detection of tardive dyskinesia is important and can be accomplished by the use of instruments such as the AIMS method.

# CHAPTER 3

## METHODS

This chapter provides a discussion of the methods to be used in this prevalence study. The topics include the research question, selection of the sample, selection of the instrument, description of the instrument and the examination for abnormal involuntary movements of tardive dyskinesia.

### RESEARCH QUESTIONS

The purpose of this prevalence study was to assess the occurrence of tardive dyskinesia among the chronically mentally ill population of a suburban mental health clinic.

There were four research questions generated:

1. What is the percentage of occurrence of tardive dyskinesia?
2. To what extent is sex a discriminator in the prevalence of tardive dyskinesia?
3. To what extent is age a discriminator in the prevalence of tardive dyskinesia?
4. Does the route of medicinal administration influence the frequency of occurrence of tardive dyskinesia?

### RATER TRAINING

The procedure to teach personnel to reliably assess and examine patients for tardive dyskinesia is referred to as rater training. Formal rater training needs to occur to have reliable assessments

occur. There are 2 components of rater training. The first component consists of: (1) an overview of tardive dyskinesia; (2) how to score; (3) how to do the examination; (4) how to separate mannerisms from tardive dyskinesia; (5) feedback rating practice with videotape component; (6) explanation of monitoring system components; and (7) pretest and posttest videotapes. The second component is the actual patient practice where tardive dyskinesia examinations and assessment are done with instructor feedback (Kalachnick and Slaw, 1985). For the training this rater received during a training session held at Eastern State Hospital, the aforementioned protocol was followed and a video taped assessment was used. Testing occurred via videotape and the current student scores had to equal scores of previous students and instructors. A passing score depended on assessing correctly abnormal involuntary movements and receiving a score of 7 out of 10 correct assessments on the modified AIMS scale. A certificate for successful completion of the assessment program is awarded. Follow-up training is recommended yearly.

## INTERRATER RELIABILITY

> According to Polit and Hungler (1983),
>
> interrater reliability is estimated by having 2 or more trained observers watching some event simultaneously and independently recording the relevant varibles according to a predetermined plan or coding system. The resulting records can then be used to compute an index of equivalence or agreement. (p. 392)

For this prevalence study, 5 participants were used for interrrater

reliability. Both raters had completed the rater training at Eastern State Hospital during the same session and were certified for successfully completing the assessment program using the modified AIMS scale.

## SPEARMAN RANK-ORDER CORRELATION COEFFICIENT

Kuzma (1984) states

> the Spearman rank-order correlation coefficient may take on values from -1 to +1. Values close to +1 indicate a high correlations; values close to zero indicate a lack of association. The minus or plus signs indicate whether the correlation coefficient is negative or positive. (p. 184-185)

## THE t DISTRIBUTION

According to Nie, Hull, Jenkins, Steinbrenner, and Bent, (1975) the t is a statistic generally applicable to a normally distributed random variable when the mean is known (or assumed to be known) and the population variance is estimated from a sample. The t distribution depends on the degrees of freedom. The probability for t is usually two-tailed, that is, the probability for a value of [t] (the absolute value of t) or larger. The t is a statistic which may be computed for a normally distributed variable; to compute a t value, for a pair of sample means, the following must be considered:

1. The sample mean is a normally distributed variable.
2. The difference of two normally distributed random variables is a normal random variable.

The difference of the sample means is a normally distributed variable with mean and variance. (p. 268-269)

## SELECTION OF SAMPLE

The participants of the prevalence study were selected from the chronically mentally ill population of a suburban mental health clinic in Virginia. Because of administrative and confidentiality concerns, the clinic identification is not possible. The vast majority of the participants carried the diagnosis of schizophrenia but there were also several participants whose diagnosis included manic-depressive illness. According to the Task Force on Late Neurological Effects of Antipsychotic Drugs (1980), in current American Medical practice, the use of neuroleptic medications is primarily for the short-term treatment of acute psychotic episodes and for sustained maintenance or preventative therapy. Neuroleptics are typically required as a temporary addition to lithium during manic excitement. Prolonged use of neuroleptics is generally indicated for maintenance treatment of chronic psychotic disorders, such as schizophrenia, in which a patient, although improved, is not symptom free and is responsive to continued treatment. For the most part, maintenance treatment with neuroleptics is supported only for schizophrenia (Task Force on Late Neurological Effects of Antipsychotic Drugs, 1980).

The participants in this prevalence study were seen during their regularly scheduled clinic visits between June 8, 1987 and July 2, 1987. Only patients who voluntarily agreed to participate in the

assessment became participants in the study. With some patients seen at the clinic weekly or more frequently, only their first visit was assessed, with movements from that assessment being counted. Patients selected were also cooperative and fairly stable, who were seen routinely at the clinic and had been able to establish some rapport with evaluator. There was no attempt to include certain patients due to race, age or sex.

INSTRUMENT SELECTION

Of the 7 scales which currently may be used to measure movements in patients as listed by Kalachnik and Slaw (1985), the Abnormal Involuntary Movement Scale (AIMS) modified was selected. The AIMS assessment instrument was developed by the psychopharmacology research branch of the National Institute of Mental Health. It is used for physical measurement and clinical quantification of tardive dyskinesia. The AIMS examination generally takes approximately 10 minutes and should be done at a minimun of twice a year. The instrument is presented in Appendix B.

The standardized AIMS examination procedure is as follows: (Kalachnik, 1984)

1. Observe patient unobtrusively at rest.
2. Chair to be used in this examination should be hard and firm without arms.
3. After observing patient, he may be rated on a scale of 0 (none), 1 (minimal or questionable), 2 (mild), 3 (moderate,

obvious, bothersome), and 4 (severe, debilitating) according to severity of symptoms.

4. Ask the patient whether anything is in his mouth (gum, candy, etc.) and if there is, to remove it.
5. Ask patient if he wears dentures and if they bother him (ill-fitting, etc).
6. Ask patient if he notices any movements in mouth, face, hands or feet. If yes, ask patient to describe and to what extent do they bother patient or interfere with his activities.

EXAMINATION

1. Have patient sit in chair with hands on knees, legs slightly apart, and feet flat on floor. (Look at entire body for movements while in this position.)
2. Ask patient to sit with hands hanging unsupported. (Observe hands and other body areas.)
3. Ask patient to open mouth. (Observe tongue at rest within mouth.) Do this twice.
4. Ask patient to protrude tongue. (Observe abnormalities of tongue movement.) Do this twice.
5. Ask patient to tap thumb, with each finger, as rapidly as possible for 10-15 seconds; separately with right hand, then with left hand. (Observe facial and leg movements.)
6. Flex and extend patient's left and right arms. (One at a time.)

7. Ask patient to stand up. (Observe in profile. Observe all body areas again, hips included.)
8. Ask patient to extend both arems outstretched in front with palms down. (Observe trunk, legs and mouth.)
9. Have patient walk a few paces, turn and walk back to chair. (Observe hands and gait.) Do this twice. (p. 56)

Kalachnik and Slaw (1985) suggest the rater note the body areas from the top of the body vertically, straight down, therefore, the rater can easily view the patient systematically as follows:

face -view face for tics/grimaces

ocular - view eyes for blinking

oral - view mouth for lip smack/pucker/etc.

lingual - view tongue for tongue thrusting, tremor, etc.

head/neck/trunk - view head/neck/trunk for retrocollis, axial hyperkinesisa, etc.

upper limb - view hands/fingers (wrists for athetoid, myokymic, etc.

lower limb - view feet, ankles for ankle flexion, foot tapping, etc. (p. 59-60)

To summarize, the rater must constantly shift his eyes from specific body area to specific body area during the course of the examination. If a movement is frequent or severe, it will be seen upon most of the samples of that body area. Minimal or mild movements will not be seen upon every sample. A minimal or mild movement may

be missed by viewing another body area while it occurs, but frequent shifting of body areas lessens the probability of this (Kalachnik and Slaw, 1985).

## SUMMARY

This chapter views the discussion of the sample and selection for the prevalence study, discussion of the instrument, training necessary and the actual procedure to follow in using the AIMS--Abnormal Involuntary Movement Scale--in evaluating a patient for tardive dyskinesia.

CHAPTER 4

## ANALYSIS OF RESULTS

The purpose of this study was to assess the occurrence of tardive dyskinesia among a chronically mentally ill sample of a suburban mental health clinic. Chapter 4 presents an analysis of the procedures in this end. This chapter is divided into 5 sections:

1. Discussion of Sample Characteristics
2. Demographics
3. Discussion of Instrument Reliability
4. Discussion of Research Questions
5. Discussion of Citation Analysis

### SAMPLE CHARACTERISTICS

The participants of this prevalence study were selected from the chronically mentally ill population of a mental health clinic. The majority of participants carried the diagnosis of schizophrenia but a few participants with manic-depressive diagnosis were also included.

### DEMOGRAPHICS

There were 45 participants in this prevalence study of which 17 were male participants (38 percent) and 28 were female participants (62 percent). Only patients who voluntarily and anonymously agreed to participate in the assessment became participants in the study. The participants were seen during their regularly scheduled clinic visits between June 8, 1987 and July 2, 1987. If these participants

were seen more than once during that specified time, only their initial visit was assessed. Patients were cooperative and fairly stable and had been able to establish some rapport previously with evaluator. There was no attempt to include certain patients due to race, age or sex.

## DISCUSSION OF INSTRUMENT RELIABILITY

The purpose of this prevalence study was to assess the occurrence of tardive dyskinesia among a chronically mentally ill sample of a suburban mental health clinic. The modified Abnormal Involuntary Movement Scale (AIMS) was selected. This instrument was used to assess physical measurement and clinical quantification of tardive dyskinesia. The examination consists of systematically viewing the body for abnormal involuntary movements and rating these movements on a scale of one to four.

Inter-rater reliability for this prevalence study was assessed by comparing the ratings of 2 raters who were certified in this assessment technique by the same hospital on five patients. These 2 raters observed the same participants in the prevalence study simultaneously and independently recorded the abnormal involuntary movements according to a predetermined coding system.

## RESULTS OF RELIABILITY ANALYSIS

The purpose of this study was to provide a descriptive assessment of the occurrence of tardive dyskinesia among a sample of the chronically

mentally ill population. A rating scale approach to monitoring for signs of tardive dyskinesia is most realistic. The modified Abnormal Involuntary Movement Scale (AIMS) was chosen for this particular reason. It is used for physical measurement and clinical quantification of tardive dyskinesia. The rater continually shifts his eyes from specific body area to specific body area during the course of the examination. The body areas are rated vertically from the top of the head straight down for abnormal involuntary movements (Kalachnik and Slaw, 1985). Inter-rater reliability for this instrument was assessed by comparing the ratings of 2 raters on 5 participants in the pilot study.

The inter-rater reliability assessment was employed to limit single rater bias in the measurement process. Both raters had completed the rater training at (ESH) Eastern State Hospital during the same session and were certified as competent evaluators. The reliability estimates ranged from +1.0 to 0.0 with a mean of +.917. The reliability estimates are presented in Table 1.

## ADDRESSMENT OF RESEARCH QUESTIONS

This section states the research questions and their respective results.

1. What is the percentage of occurrence of tardive dyskinesia?

An analysis of the frequency distributions indicated that 57.7 percent of the females (N=15) and 73.7 percent of the males (N=14) evidenced the involuntary muscle movements associated with tardive dyskinesia. It appeared that the tongue (34.6 percent) was the most

TABLE 1

Interrater Reliability Estimates for Site-Specific and Composite Measures

| Site | Reliability Estimates |
|---|---|
| Face | +1.0 |
| Lips | +1.0 |
| Jaw | +0.75 |
| Tongue | +0.75 |
| Neck | +1.0 |
| Upper Torso | +0.75 |
| Lower Torso | +1.0 |
| Mild Symptoms | +1.0 |
| Moderate Symptoms | +1.0 |
| GRAND MEAN | +0.917 |

prevalent site and the jaw and neck/shoulder (0.0 percent) the least prevalent site for females in this sample while the upper body (42.1 percent) was the most prevalent site and the lips, jaw, and neck/shoulder (0.0 percent) the least prevalent site in males. The frequency distributions are presented in Table 2.

2. To what extent is sex a discriminator in the prevalence of tardive dyskinesia?

There were no significant differences between male and female sites with the highest value (t=0.932) occurring between the male and female lower back while the lowest value (t=0.00) occurred between the male and female lower jaw and the male and female neck/shoulders. The male-female comparisons are presented in Table 3.

Comparisons were also computed between sex-specific sites. The values ranged from 5.88 (upper body and neck/shoulders) to 0.00 (face and upper body and jaw and neck/shoulder). Significantly different female comparisons were identified between the upper body and neck/shoulder ($p<.001$), jaw and tongue ($p<.01$), tongue and neck/shoulder ($p<.01$), and lips and tongue ($p<.02$). The female comparisons are presented in Table 4.

The male comparisons ranged from 3.33 (upper body and neck/shoulder) to 0.00 (lips and jaw, face and lower body, lips and neck/shoulder, and jaw and neck and shoulder). Significant differences were identified between lips and tongue, jaw and tongue, lips and upper body, jaw and upper body, tongue and neck/shoulders, and upper body and neck/shoulders

TABLE 2

Percentage of Sex-Specific Involuntary Movements by Assessment Site

| Site | Female | Male |
|---|---|---|
| Face | 15.4 | 21.1 |
| Lips | 3.8 | 0.0 |
| Jaw | 0.0 | 0.0 |
| Tongue | 34.6 | 36.8 |
| Upper Body | 11.5 | 42.1 |
| Lower Body | 7.7 | 15.8 |
| Neck/Shoulder | 0.0 | 0.0 |

TABLE 3

Pooled Variance t-test Comparisons Between Male and Female Body Sites

| Male/Female | Face | Lips | Jaw | Tongue | Upper Body | Lower Body | Neck/ Shoulder |
|---|---|---|---|---|---|---|---|
| Face | 0.235 | | | | | | |
| Lips | | 0.813 | | | | | |
| Jaw | | | 0.00 | | | | |
| Tongue | | | | 0.771 | | | |
| Upper Body | | | | | 1.942 | | |
| Lower Body | | | | | | 0.932 | |
| Neck/ Shoulders | | | | | | | 0.00 |

TABLE 4

Pooled Variance t-test Comparisons Between Female Body Sites

| | Lips | Jaw | Tongue | Upper Body | Lower Body | Neck/ Shoulder |
|---|---|---|---|---|---|---|
| Face | 1.581 | 2.00 | 0.80 | 0.00 | 0.677 | 2.00 |
| Lips | | 0.841 | 2.436* | 1.327 | 0.694 | 0.822 |
| Jaw | | | 3.404** | 2.00 | 1.37 | 0.00 |
| Tongue | | | | 0.954 | 1.907 | 3.404** |
| Upper Body | | | | | 0.806 | 5.88*** |
| Lower Body | | | | | | 1.37 |

LEGEND:
* p<.02
** p<.01
*** p<.001

($p<.01$). The male comparisons are presented in Table 5.

3. To what extent is age a discriminator in the prevalence of tardive dyskinesia?

Comparisons between males and females based upon specific age intervals generated two significant comparisons: between 40-49 year old males and females ($t=2.69$, $p<.05$) and 50> males and females ($t=2.467$, $p<.05$). The coefficients ranged from 2.69 (40-49 year old males and females) to 0.041 (20-29 year old males and females). The comparison of age intervals is presented in Table 6.

Female age intervals were compared to each other to determine if significant differences occurred within the respective sex. The coefficients ranged from 2.37 (between 20-29 and 40-49) to 0.164 (between 40-49 and 50>). No statistically significant differences were computed between age groups. The female age group comparison are presented in Table 7.

Male age intervals were also compared to determine their respective differences. The coefficients ranged from 2.197 (20-29 and 30-39) to 0.164 (40-49 and 50>). No statistically significant differences were computed between age groups. The male age group comparison are presented in Table 8.

4. Does the route of medicinal administration influence the frequency of occurrence of tardive dyskinesia?

The routes of administration--by mouth (PO), by intermuscular injection (IM), by mouth and intermuscular injection (IM/PO)--were

Table 5

Pooled Variance t-test Comparisons Between Male Body Sites

| | Lips | Jaw | Tongue | Upper Body | Lower Body | Neck/ Shoulder |
|---|---|---|---|---|---|---|
| Face | 0.345 | 0.345 | 1.206 | 1.613 | 0.00 | 0.345 |
| Lips | | 0.00 | 2.973* | 3.326* | 1.757 | 0.00 |
| Jaw | | | 2.973* | 3.326* | 1.757 | 0.00 |
| Tongue | | | | 0.408 | 1.135 | 2.97* |
| Upper Body | | | | | 1.524 | 3.33* |
| Lower Body | | | | | | 1.75 |

LEGEND: * $p<.01$

TABLE 6

Pooled Variance t-test Comparisons of Male and Female Symptom Frequency for Respective Age Intervals

| Male/Female | 20-29 | 30-39 | 40-49 | 50> |
|---|---|---|---|---|
| 20-29 | 0.041 | | | |
| 30-39 | | 0.467 | | |
| 40-49 | | | 2.69* | |
| 50> | | | | 2.467* |

LEGEND: * p<.05

TABLE 7

Pooled Variance t-test Comparisons Between Female Age Intervals

| | 30-39 | 40-49 | 50> |
|---|---|---|---|
| 20-29 | 1.348 | 2.37 | 1.663 |
| 30-39 | | 1.586 | 1.595 |
| 40-49 | | | 0.164 |

TABLE 8

Pooled Variance t-test Comparisons Between Male Age Intervals

| | 30-39 | 40-49 | 50> |
|---|---|---|---|
| 20-29 | 2.197 | 0.821 | 0.297 |
| 30-39 | | 2.082 | 1.588 |
| 40-49 | | | 0.164 |

compared to determine if one route of administration was significantly different than any other with regard to the prevalence of tardive dyskinesia. The coefficients ranged from 2.426 (between male PO and female IM/PO) to 0.00 (between male IM and female IM). No statistically significant differences were found between the respective routes of administration and between the respective sexes. The comparisons between sex-specific routes of administration are presented in Table 9.

## SUMMARY

This chapter presented a discussion of the analysis of the results of this prevalence study. This chapter was divided into 4 sections: sample characteristics, demographics, instrument reliability and research questions. There were 45 participants in this prevalence study of which 17 were male participants (38 percent) and 28 were female participants (62 percent), obtained from a chronically mentally ill population in a suburban mental health clinic of which there are approximately 450 clients. There was no attempt made to include participants of a certain age or sex. There are no significant differences between male and female body sites and there were no significant differences between and within the respective sexes with regard to the mechanism of medication administration. Age and sex appeared to be significant delineators.

## TABLE 9

### Pooled Variance t-test Comparisons Between Sex-Specific Medication Administration Routes

| | Male | | Female | | |
|---|---|---|---|---|---|
| | IM | IM/PO | PO | IM | IM/PO |
| **Male** | | | | | |
| PO | 0.182 | 0.306 | 1.90 | 1.98 | 2.426 |
| IM | | 0.418 | | 0.00 | 1.06 |
| IM/PO | | | | | 0.28 |
| **Female** | | | | | |
| PO | | | | 1.67 | 1.98 |
| IM | | | | | 0.97 |

LEGEND: PO By Mouth
IM Intermuscular Injection
IM/PO By Mouth and Intermuscular Injection

# CHAPTER 5

## SUMMARY AND RECOMMENDATIONS

The following discussion presents the summary and recommendations for this prevalence study. The chapter is divided into 4 parts: summary, interpretation and implications, conclusions, and recommendations.

### SUMMARY

The purpose of this study was to provide a descriptive assessment of the prevalence of tardive dyskinesia among a sample of the chronically mentally ill population. The following specific research questions were generated from this purpose:

1. What is the percentage of occurrence of tardive dyskinesia?
2. To what extent is sex a discriminator in the prevalence of tardive dyskinesia?
3. To what extent is age a discriminator in the prevalence of tardive dyskinesia?
4. Does the route of medication administration influence the frequency of occurrence of tardive dyskinesia?

The participants in this prevalence study were selected from the chronically mentally ill clients of a suburban mental health clinic. There were 45 participants who voluntarily and anonymously agreed to participate. The majority of the participants carried a diagnosis of schizophrenia, with the remainder being diagnosed as having a manic-depressive illness. Inter-rated reliability was

assessed on the AIMS instrument by having 2 raters who had previously completed training at the same hospital, at the same instruction session, rate 5 participants in this prevalence study simultaneously and independently. The mean interrater reliability estimate was +.917. Age and sex appeared significant discriminators. Symptom frequency for respective age intervals in both males and females appeared significant at age 40-49 and 50≥. In comparing male and female body sites, there were no significant differences between male and female body sites. Body sites which were significant in both sexes were lips, jaw, tongue, upper body and neck/shoulders. There were no significant differences between or within the respective sexes with regard to the mechanism of medication administration.

## INTERPRETATION AND IMPLICATIONS

Currently, there are 7 scales which may be used to measure abnormal involuntary movements as listed by Kalachnik and Slaw (1985). The AIMS--Abnormal Involuntary Movement Scale--was used in this prevalence study. This assessment instrument is used for physical measurement and clinical quantification of tardive dyskinesia. The rater must constantly shift his eyes from specific body areas to specific body area during the course of the examination. Minimal or mild movements will not be seen upon every sample (Kalachnik and Slaw, 1985). A mean inter-rater reliability estimate of +.917 indicates that the 2 raters generally saw the same abnormal involuntary movements and rated them the same. There were no significant differences between

abnormal involuntary movements between male and female body sites. There also were no significant differences between and within the respective sexes with regard to the mechanism of medication administration (PO, IM, IM/PO). The age and sex of the participants in the prevalence study appeared significant. Taub (1986) notes that age is one of the most consistently reported risk factors with higher frequencies of tardive dyskinesia being observed in the older female population. This prevalence study appeared to indicate young males to be more prone to the symptoms of tardive dyskinesia. Morgenstern et al. (1987) state that findings of a higher rate of tardive dyskinesia among users of oral neuroleptics is consistent with several previous studies. This prevalence study showed no significant differences with regards to the mechanism of administration.

## CONCLUSIONS

The following review of findings is based upon research questions and methodologies outlined in Chapter 2 and data provided in Chapter 4.

1. Comparing male and female symptom frequency for respective age interval, the highest frequency was in the 40-49 age interval in males and in the 50≤ age interval in females.
2. There are no significant differences between male and female body sites in this sample.
3. The data appeared to indicate that younger males tended to be more prone to symptoms of tardive dyskinesia than older subjects.

4. There was no significant difference between and within the respective sexes with regard to the mechanisms of administration (PO, IM, IM/PO).
5. Inter-rater reliability was performed and the mean was .917.
6. Other findings were also observed during the administration of the AIMS (modified) testing. The need to regulate medication due to other side effects could be noted. Also, physical problems (rashes, etc.) could be referred to proper treatment modalities.
7. Since tardive dyskinesia is transient in symptomology, repeated measures must transpire if accurate assessment is to take place.

RECOMMENDATIONS

Seven recommendations have been suggested upon the completion of this study:

1. Prevention, prompt detection and management of early, possibly reversible cases of tardive dyskinesia is imperative.

According to Johnston et al. (1980), psychiatric health care has changed its focus from the traditional office/hospital medical practice, to the community primary care setting and mental health centers. This changing focus has given rise to expanded roles for nurses, nurse practitioners, clinical pharmacists, physician assistants to name a few. These health care providers who are now in a position to monitor psychiatric patients and their symptoms need to be able to assess their clients for symptoms of tardive dyskinesia. Education and training which is uniform must be provided to these health care

providers. Careful screening and monitoring of these clients on neuroleptics is imperative to diagnose tardive dyskinesia.

2. Research needs to be funded, especially in the investigation of neurotransmitters.

E. Fuller Torrey (1987), in his article "Hope Through Research," writes about schizophrenia not being a fashionable disease to have nor a fashionable disease to treat. Consequently, schizophrenia research is the most neglected and under-researched disease in the Western world. More money must be made available for schizophrenia research, especially in the area of brain chemistry.

3. Prescribing medications on the lowest possible therapeutic dose and giving these antipsychotic medications only to appropriate patients.

Freishtat and Einhorn (1981) discuss in their article the prescription and over-prescription of antipsychotic medications and the frightening adverse effects they have on patients. The importance of prescribing antipsychotic medication only to appropriate patients and then on the lowest possible therapeutic dose. Judicious use of antipsychotic drugs must be stressed. Some physicians/clinics currently are prescribing antipsychotics during periods where symptomology is present, stabilizing their patients, then discontinuing the medication. Close monitoring of these patients is essential to detect early signs of psychosis and deterioration of mental status. This innovative approach to treatment of psychiatric patients may have an influence on decreasing

the prospect of these patients contracting tardive dyskinesia.

4. Other methods of controlling symptomology need to be explored.

ECT (electro-convulsive therapy) is an alternative to neuroleptic medication in some cases. It is currently experiencing a resurgence in popularity due to litigation in the use of neuroleptics. More exploration needs to be done in the use of ECT.

5. A warning that neuroleptics may cause tardive dyskinesia should be included on package inserts.

Gualtieri (1985) recommends antipsychotic medications carry a warning on their package inserts, similiar to the Surgeon General's cigarette warning, that should be prominently displayed. This warning could provide another step in educating the public as to the dangers of using neuroleptics and tardive dyskinesia.

6. Patients and/or their families need to be informed of the risk of long term antipsychotic drug treatment, especially regarding tardive dyskinesia.

7. Lastly, but perhaps most importantly, pharmaceutical companies must expend more time and money to search for neuroleptics with fewer side effects such as tardive dyskinesia.

According to Tarsy and Baldessarini (1984), clozapine, a new antipsychotic medication which remains investigational in the United States, produces few if any acute or persistent extrapyramidal effects. New medications without serious side effects must be made available to treat our chronically mentally ill population.

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## ANTIPSYCHOTIC MEDICATIONS

| GENERIC NAME | TRADE NAME |
|---|---|
| Phenothiazines | |
| Aliphatic | |
| Chlorpromazine | Thorazine |
| Piperidine | |
| Thioridazine | Mellaril |
| Mesoridazine | Serentil |
| Piperazines | |
| Trifluoperazine | Stelazine |
| Fluphenazine | Prolixin, Permitil |
| Perphenazine | Trilafon |
| Thioxanthenes | |
| Thiothixene | Navane |
| Butyrophenones | |
| Haloperidol | Haldol |
| Dihydroindolones | |
| Molindone | Moban |
| Dibenzoxazepines | |
| Loxapine | Loxitane |

(Hayes, 1983)

# A simple method to determine Tardive Dyskinesia Symptoms AIMS* Examination Procedure

Patient Identification Date

Rated by

Either before or after completing the examination procedure, observe the patient unobtrusively at rest (eg, in waiting room).

The chair to be used in this examination should be a hard, firm one without arms.

After observing the patient, he may be rated on a scale of 0 (none), 1 (minimal), 2 (mild), 3 (moderate) and 4 (severe) according to the severity of symptoms.

Ask the patient whether there is anything in his/her mouth (ie, gum, candy, etc) and if there is to remove it.

Ask patient about the *current* condition of his/her teeth. Ask patient if he/she wears dentures. Do teeth or dentures bother patient *now?*

Ask patient whether he/she notices any movement in mouth, face, hands or feet. If yes, ask to describe and to what extent they *currently* bother patient or interfere with his/her activities.

| 0 | 1 | 2 | 3 | 4 | Have patient sit in chair with hands on knees, legs slightly apart and feet flat on floor. (Look at entire body for movements while in this position.) |
|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | Ask patient to sit with hands hanging unsupported. If male, between legs, if female and wearing a dress, hanging over knees. (Observe hands and other body areas.) |
| 0 | 1 | 2 | 3 | 4 | Ask patient to open mouth. (Observe tongue at rest within mouth.) Do this twice. |
| 0 | 1 | 2 | 3 | 4 | Ask patient to protrude tongue. (Observe abnormalities of tongue movement.) Do this twice. |
| 0 | 1 | 2 | 3 | 4 | Ask the patient to tap thumb, with each finger, as rapidly as possible for 10–15 seconds; separately with right hand, then with left hand. (Observe facial and leg movements.) |
| 0 | 1 | 2 | 3 | 4 | Flex and extend patient's left and right arms. (One at a time) |
| 0 | 1 | 2 | 3 | 4 | Ask patient to stand up. (Observe in profile. Observe all body areas again, hips included.) |
| 0 | 1 | 2 | 3 | 4 | †Ask patient to extend both arms outstretched in front with palms down. (Observe trunk, legs and mouth.) |
| 0 | 1 | 2 | 3 | 4 | †Have patient walk a few paces, turn and walk back to chair. (Observe hands and gait.) Do this twice. |

*Abnormal Involuntary Movement Scale † Activated movements

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