

Interactions Between Drug and Psychosocial Therapy in Schizophrenia

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Abstract

Research on the interactions between drug and psychosocial interventions in the community management of schizophrenia is related to a stress/vulnerability conception of this disorder. Earlier findings that psychosocial treatments were not efficacious in the community management of schizophrenia are contrasted with promising recent data from psychosocial treatments aimed at reducing environmental stressors and promoting interpersonal competence. Family interventions and social skills training may contribute significantly to the clinical and social outcomes achieved by optimal pharmacotherapy.

Schizophrenia remains one of the most complex and fascinating disorders. There is now general agreement that its origin is probably multidetermined. The stress-diathesis model (Zubin and Spring 1977; Liberman 1982) uses biological, genetic, and environmental variables to explain the onset, exacerbation, and remission of schizophrenia. It is postulated that a biologically vulnerable individual succumbs to socioenvironmental stressors with the manifest psychopathology of schizophrenia. Protection against the ravages of this disorder is hypothetically afforded through neuroleptic drugs and social support.

Schizophrenia is a disorder that is characterized by symptoms of thought interference (thought insertion, withdrawal, and broadcasting), thought and perceptual distortion (delusions and hallucinations), abnormalities of affective expression (flattening and inappropriate expression), and motor function (catatonia). Except in the most severe cases, however, the phenomenology is in a dynamic,

changing state. Indeed, the person suffering from schizophrenia may experience the phenomena for a relatively brief period each day. During large portions of his daily experience, his cognitive, affective, and behavioral functioning may be within the normal range. Thus, the underlying biological and environmental factors may be in a similar state of flux, accounting for the inconsistency of symptoms. This feature of schizophrenia creates considerable problems in clinical assessment and research evaluations. Of course, it also presents an enormous dilemma for the patient himself and for his caregivers.

The impaired psychosocial functioning associated with schizophrenia may be to a large extent determined by the extent to which subjectively experienced symptoms impinge upon the individual's functioning. When hallucinatory experiences occur continuously, the individual cannot attend to his immediate environment or exhibit logical decision-making. Similarly, a strongly held delusional conviction may pervade all perceptions of the external world and seriously distort judgment. But it should not be assumed that the impaired psychological functioning that accompanies these phenomena cannot be modified by the individual's cognitive coping strategies. For example, a person who has a well-defined view of external reality may recognize the improbability of a delusion and be less preoccupied by it than a person given to mystical ideas; or another person may employ logic to recognize that the disembodied voice he hears must have a hallucinatory

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origin, and attempt to minimize the attention he accords the experience. The ability to cope effectively with the impaired psychological functioning associated with schizophrenia may be a skill that can be learned in the same way that a person with a visual or hearing impairment learns to adapt to his sensory deficits.

The behavioral handicaps that accompany psychosocial impairments are linked to the assets and deficits of the patient's premorbid development, as well as the support of his social network. Despite attempts to classify the "negative" symptoms of schizophrenia (Andreasen 1982), it is difficult to separate them from the unwanted effects of drugs and to explain their increased prominence in understimulating environments. Whether they are primary symptoms of schizophrenia or secondary handicaps is not yet clear. The lack of spontaneity, the apathetic appearance, and the social withdrawal characteristic of patients with negative symptomatology are suggestive of catatonic stupor, and might even be considered *formes frustes* of this phenomenon.

Inseparable from illness-related handicaps in social role functioning are deficits in social behavior evident before the onset of illness. A person who had good social skills and a successful career before the onset of schizophrenia may be expected to retain many of his former skills despite the disruptive effects of the illness. On the other hand, a person who before becoming ill had lacked conversational ability and had never worked would be unlikely to display social competence in these areas after the abatement of florid symptomatology. Social role functioning depends on learning. Without appropriate social reinforcement for work or social skills, these functions deteriorate. Thus, the patient's social

network of family, friends, and rehabilitation professionals can play an important role in maximizing the effective use of the patient's existing repertoire of social behaviors, and in enhancing his acquisition of new skills.

Schizophrenia is a disorder characterized by psychological impairments of attention, concentration, and decision-making, as well as social impairments in affective and behavioral realms. These impairments combine with premorbid social functioning and the nature of the social environment to determine the extent of the individual's handicap in his social role functioning. Drug therapy appears to exert its greatest influence on expressions of illness such as hallucinations, delusions, and thought interference and to have less effect on environmentally related features such as motivation to work and social competence. On the other hand, psychosocial intervention might be more likely to influence the latter type of handicaps and to have less effect on the core features of the illness. Although compelling in its simplicity, this analysis of the respective contributions of drug and psychosocial therapies overlooks evidence that more complex drug-environment interactions occur (Birley and Brown 1970; Vaughn and Leff 1976).

An Interactive Model of Schizophrenia

If we assume that the symptoms, impairments, and psychosocial handicaps that comprise the clinical syndrome of schizophrenia as defined in *DSM-III* (American Psychiatric Association 1980) are in equilibrium with biological and environmental determinants, then what are the processes that mediate the impact of biological and environmental contingencies? The appearance or exacer-

bation of symptoms of schizophrenia may occur in a vulnerable individual when:

- The biological vulnerability increases;
- Stressful life events overwhelm the individual's coping resources;
- The individual's social supports diminish.

Biological Vulnerability. Relatively little is known about the precise nature of the biological diathesis in schizophrenia. Genetic studies do not point to any simple mode of inheritance. Biochemical studies postulate anomalies of brain metabolism that alter neural transmission and appear to be ameliorated by antipsychotic drugs. In addition, there is some empirical evidence that these drugs reduce the vulnerability to relapse from the impact of life events (Birley and Brown 1970; Leff et al. 1973; Leff and Vaughn 1981) and ambient stressors such as family tension (Brown, Birley, and Wing 1972; Vaughn and Leff 1976). However, the modulation of biological vulnerability by drugs cannot fully counter a vulnerable person's susceptibility to relapse through environmental stress. Thus, despite optimal medication, half the people who develop schizophrenia have exacerbations within a year of discharge (Hogarty et al. 1979).

To predict biological vulnerability, measures that reflect its fluctuations are necessary. To date, there are no genetic markers that can identify individuals at risk for the disorder so that primary prevention might be employed. Nor are any biochemical tests proved for general clinical application. Dysfunction of cognitive processing and excessive physiological arousal might prove to be traits reflecting underlying deficiencies in the central nervous system (Dawson, Nuechterlein, and

Lieberman 1982). However, these states of sensory overload and hyperarousal are most evident when the individual is under stress, and may be best considered as mediators or warning signals of impending exacerbations. If current research can document that an individual's reactivity to transient stressors is a measure of his latent vulnerability to schizophrenic symptoms, then signs of autonomic arousal (heart rate, blood pressure, and electrodermal response) and cognitive disorganization may prove to be helpful indicators of the need for increases in drug dosage before the onset of symptoms.

Life Stress and the Course of Schizophrenia. There is mounting evidence that exacerbations in the course of a schizophrenic illness are associated with environmental stress. Two types of stressors have been identified as having the potential to increase the risk of relapse: (1) ambient stressors and (2) stressful events. Ambient stressors include the family milieu (Vaughn and Leff 1976), the work environment (Wing, Bennett, and Denham 1964), and persistent stressors of daily life, such as serious poverty or chronic physical disability (Brown and Harris 1978). Stressful events include changes in the social milieu, such as losses of friends or relatives, acute illness, or work-related difficulties (Brown and Birley 1968; Jacobs and Myers 1976). However, not every person subjected to these stressors experiences an exacerbation of schizophrenia. It is postulated that when stressors overwhelm the ability of the vulnerable person and his social support system to cope effectively, the risk of relapse is high. At such times the threat produced by the stressful event or situation may be neutralized by emotional support

accompanied by cognitive problem solving. The ready availability of a network of supportive social contacts, coupled with the social skills repertoire needed to deploy the problem-solving resources available in that network, may be important in mitigating major sources of stress. Persons who develop more chronic, persistent, or relapsing courses of schizophrenia tend to have smaller social networks and smaller repertoires of social skills than those whose illnesses follow a more benign course (Goldstein 1978). Thus, the symptomatic course of schizophrenia may be, in part, determined by the interaction between the amount and threat of life stressors and the problem-solving capacities of the individual and his support network (Lieberman et al. 1980).

Evidence for Drug-Psychosocial Interactions

There is some evidence to suggest that a management approach that attempts to cushion biological vulnerability and reduce environmental stress may facilitate favorable outcomes, at least with respect to florid psychopathology and associated psychosocial impairments. In assessing outcome, however, it is crucial to consider the impact of treatment on the quality of life of the sufferer and his associates. The role of interventions on the individual's social role functioning and his family's life situation is a vital, yet often neglected area to consider.

Drug and psychosocial therapies may be related in a number of ways. Possibilities include the following:

- Psychosocial treatment adds nothing to the beneficial effects of drug treatment.
 - Drug treatment adds nothing to the beneficial effects of psychosocial treatment.
 - Psychosocial treatment detracts from the benefits of drug treatment.
 - Drug treatment detracts from the benefits of psychosocial treatment.
 - Psychosocial and drug treatments combine to provide additive benefits.
 - Psychosocial and drug treatments combine to provide synergistic benefits.
- Although there is some research evidence bearing upon these possibilities, few controlled studies have been carried out under similar treatment conditions, with similar target populations. Thus, the ability to generalize between disparate studies is very limited. Although the focus of this article is the clinical and social functioning of the schizophrenic patient in the community rather than the hospital management of the acute episode, it should be remembered that the efficacy of the drug therapy of acute schizophrenia varies as a function of the nature of the support provided by the milieu (Rathod 1958; Hamilton et al. 1960, 1963; Goldsmith and Drye 1963).
- Psychosocial Treatment Does Not Improve the Efficacy of Drugs.** The conclusion that psychodynamic psychotherapy does not manifestly enhance the benefits attributed to antipsychotic drugs derives from two major inpatient studies of schizophrenic patients. May (1968) randomly assigned subacute patients recently admitted to a large state hospital to drug treatment, psychotherapy, drug treatment plus psychotherapy, milieu therapy, and electroconvulsive therapy (ECT). The psychotherapy, which was conducted largely by residents in training under the supervision of psychoanalysts, was "ego supportive and reality

defining." A battery of measures of clinical, psychological, and social functioning indicated a clear superiority for drug treatment over psychotherapy and ECT. There was no interaction between drug treatment and psychotherapy. A slight benefit was noted for the combination of drugs and psychotherapy in reduced costs of the first year of followup treatment, as well as a reduction in the days hospitalized over a 5-year followup period (May and Tuma 1976).

An earlier study by Grinspoon, Ewalt, and Shader (1967, 1972) compared antipsychotic drugs to placebo in a milieu program supplemented by intensive psychoanalytic psychotherapy. Patients were all initially stabilized on drugs, and then a randomly selected group was switched to placebo. Rapid deterioration was common in the placebo group despite psychotherapy provided by experienced therapists. Patients who received active drugs with their psychotherapy showed maximal benefits during the first 10–12 weeks of the study, although treatment continued intensively for 2 years. The lack of further benefits to drug-treated patients coupled with the earlier deterioration of those on placebo suggested that this type of psychosocial intervention was relatively ineffective with the chronic patients selected for study. The crossover design involving drug withdrawal seemed to account for much of the variance in this study. The expectancies associated with placebo effectiveness are complex in such a manipulation. Similar deterioration might well have occurred if established psychotherapy had been abruptly replaced with placebo psychotherapy. Psychological dependence on drug therapy is a strong factor in chronic schizophrenic patients and needs to be considered

in the design of studies with this population.

Hogarty and colleagues (1973, 1974, 1975, 1979) in two studies of recently discharged, medicated schizophrenics found that sociotherapy had no beneficial effect upon the clinical or social adjustment of patients during the first year of treatment over and above the prescribed antipsychotic drug. The intervention consisted of social casework and vocational rehabilitation that was delivered by experienced social workers during sessions scheduled at about 2-week intervals. Patients were withdrawn from the study upon relapse. In one study "survivors" beyond 18 months showed significant clinical and social benefits from combined drug and sociotherapy management. However, because the random control had been lost through attrition, generalizable conclusions could not be drawn. In the subsequent 1979 study, sociotherapy did not enhance drug efficacy overall, but was more effective in combination with intramuscular neuroleptics than in combination with oral drugs. This points to a major problem associated with drug treatment in the community: namely, ensuring drug compliance. At present the only way to be sure of achieving control over the adequacy of drug ingestion in the community is through depot neuroleptics.

In a review of controlled studies of psychosocial therapies in schizophrenia, May (1976) found no evidence for the benefits of individual or group psychotherapy for schizophrenia, but overwhelming evidence for the effects of pharmacotherapy. The studies reviewed were almost exclusively conducted in hospital-based units where nursing contact, occupational therapy, and social casework were provided extensively. It is possible that the

pervasive effects of these treatments may have obscured the effects of even daily sessions of psychodynamic psychotherapy.

Neuroleptic Drugs Do Not Improve the Efficacy of Psychosocial Treatment.

In a post hoc review of 49 patients with schizophrenia who had been treated for 4 months on a richly staffed inpatient research unit, Carpenter, McGlashan, and Strauss (1977) found no outcome differences between 22 drug-treated patients and 27 drug-free patients. There was an increased likelihood for drug-treated patients to experience depression and a tendency for enhanced work and social functioning in the drug-free group. Patients had received extensive support on the small research unit, with psychotherapy that aimed to integrate the illness experience within their own life framework. Somewhat similar results were reported in a state hospital setting in the absence of intensive therapy (Carroll et al. 1980). The possibility that at least some patients with schizophrenia may remit without drugs or psychosocial interventions should be considered.

Naturalistic studies of family milieu have shown that when there is a supportive, nonintrusive home environment, relapse of schizophrenia is less likely than in a milieu where critical and overinvolved attitudes prevail (Brown, Birley, and Wing 1972; Vaughn and Leff 1976; Vaughn et al. 1982). In the first 9 months after discharge, regular drug therapy provided no added protection against relapse for those living in more tolerant environments, but was valuable for patients who returned to stressful settings. It is important to note that the contrast in these studies was between "regular" and "irregular" drug ingestion—not drugs versus *no drugs*. Irregular drug

taking may be a marker of cognitive impairment and portend future relapse (Falloon, Watt, and Shepherd 1978a). A 2-year followup by Leff and Vaughn (1981) indicated that the benefits of drugs were evident in the second year, even in those persons who were living in benign households. Birley and Brown (1970) found that regular drugs provided similar partial protection for patients who were at risk for relapse following a recent stressful life event.

In a very thorough study of long-stay chronic psychiatric patients in a state hospital Paul, Tobias, and Holly (1972) assigned matched patients to two intensive psychosocial treatment units: (1) a therapeutic community and (2) a token economy program. All patients were stabilized on medication at the time of transfer to the units. Patients on each unit were then further matched and assigned to either continued drugs or placebo. All patients showed significant improvement in psychopathology and social adjustment, but greater improvement was evident in the token economy unit. After 4 months, patients on drug and placebo were equally improved. In these chronic patients the benefits of continued drug therapy were not evident. Furthermore, there was evidence that patients acquired socially adaptive skills more quickly on placebo than on active medication.

Paul, Tobias, and Holly worked with 106 institutionalized patients who had resisted all previous rehabilitation efforts. After 2 years or more of intensive psychosocial therapy, the results were dramatic (Paul and Lentz 1977). Ninety-seven percent of the social learning/token economy patients and 71 percent from the therapeutic community attained enduring community tenure. Fewer than 25 percent of the study patients

were on continuing drug therapy, whereas all had been prescribed drugs at the start of the program.

It may be concluded that drug therapy probably exerts its maximal benefits in protecting the unstable, floridly ill, or impaired person from stressors, which may include intensive psychoanalytic psychotherapy, social casework, or "total push" rehabilitation approaches, as well as ambient stress in the home, ward, work, or social environment. However, continued drug therapy may have limited benefits when used with chronic patients in nonthreatening environments or supportive psychosocial rehabilitation programs; and with acute patients who are discharged after stabilization of florid symptoms to supportive, non-demanding social environments. In the latter group, relapse may occur when stressful life changes intervene—including changes in social and work relationships—and at these points drug therapy may perform a vital prophylactic function.

Psychosocial Treatment Reduces Drug Effectiveness. There is some evidence that psychosocial treatment that is stressful, confrontative, or overstimulating may prove less effective than drugs given within a limited supportive setting. In the NIMH collaborative study of psychotherapy with drugs, Goldberg et al. (1977) found that active rehabilitation tended to increase exacerbations in patients who had residual florid symptoms. It was thought that pressures to work and expand social activities overwhelmed the individual while his cognitive capacity was functionally limited. Several similar studies have documented exacerbations associated with vigorous rehabilitation efforts that have not accounted for individuals' residual

impairments (Wing, Denham, and Bennett 1964). The Paul study, characterized by individualized behavioral programming, with graded goals and enriched schedules of reinforcement, was notably free from such problems.

Increased leisure activity, a more socially stimulating environment, and intensive psychosocial supervision were associated with exacerbations of symptoms in an innovative study of fostering of chronic schizophrenic patients (Linn, Klett, and Caffey 1980).

However, it is questionable whether patients would opt for a socially understimulating life experience to avoid relatively infrequent episodes of florid psychosis. Excessive clinical preoccupation with the prevention of relapse may lead to the re-creation of the inhumane, understimulating environments prevalent in the institutions of the recent past, with an associated increase in the behavioral handicaps that rapidly develop under such conditions (Wing 1978).

The psychophysiological effect of antipsychotic drugs can be observed in improved information processing and normalization of autonomic arousal (Greenberg, Altman, and Cole 1975; Spohn et al. 1977; Oltmanns, Ohayn, and Neale 1978). This appears to enable the schizophrenic person to use more effective cognitive strategies to cope with added environmental stimulation. The balance between the amount of stimulation that can be tolerated and the amount of drug required to allow optimal psychosocial functioning may need to be titrated as the dynamic interplay of planned and unplanned stressors of community living impinges upon the vulnerable individual.

Drug Treatment Reduces the Effec-

tiveness of Psychosocial Interventions. In much of the combined drug and psychosocial literature it is assumed that the effectiveness of all antipsychotic drugs at different dosages is equivalent. Just as different psychosocial interventions of varying intensity, duration, and timing may exert favorable or unfavorable effects upon the symptoms, impairments, and handicaps of schizophrenia, drugs may exert disparate effects—not all of which are universally beneficial.

There are no reported large-scale studies clearly documenting the detrimental effects of drugs on a psychosocial intervention program. As described above, Paul and Lentz (1977) found some suggestion of superior social learning in chronic institutionalized patients who did not receive active drugs. Liberman, Marshall, and Burke (1981) reported a case study of an assaultive patient who was effectively controlled by a behavioral program of positive reinforcement for nonbelligerent behavior coupled with time-out from reinforcement for assaultive behavior. In a systematic ABAB design of alternate drug/no drug periods, the patient's threats and assaults could be controlled only during the nondrug periods. In this case the drugs clearly impaired the psychosocial intervention aimed at improving a socially handicapping behavior. However, in a similar unreported case of a young woman, who in addition to her schizophrenia was moderately mentally retarded, a behavioral reinforcement program to control unprovoked assaults on family members proved ineffective until her initially very low dose of neuroleptic was increased to a higher level. In some instances drug therapy may be vital, while in others it may impair learning of socially effective responses.

Some evidence for impaired learning during neuroleptic treatment is provided by animal studies. The ability of a substance to impair learning of the conditioned avoidance response in laboratory animals is a screening test for new drugs thought to have potential neuroleptic properties. When given a neuroleptic, a rat will not attempt to avoid a shock despite a warning signal, but will wait passively until the shock is delivered and then turn it off by pressing a lever. Passive behavior seen in some medicated patients also suggests that drugs may sometimes impede learning of social behavior (Doty and Doty 1963). More subtle psychosocial impairments may be observed when different drug preparations are compared. A controlled study has indicated that long-acting intramuscular drugs may impair social functioning more than oral preparations, despite similar clinical effectiveness (Falloon, Watt, and Shepherd 1978*b*). This may be a function of a higher prevalence of parkinsonian side effects that may be associated with currently available long-acting preparations.

Although there is no evidence for an overall detrimental effect of drugs on psychosocial interventions, each case needs to be carefully reviewed for the indications for drug therapy, the optimal choice of drug, and the minimal dosage required to maximize social functioning while maintaining symptom control. The last choice requires frequent reassessment as medication needs may vary with changing environmental and biological contingencies. Clinically feasible measures of cognitive and physiological functioning are urgently needed to warn the clinician of impending decompensation and the need for increased dosage. Warning signals in the patient's behavior or somatic state (e.g., sleep

disturbance, agitation, distractibility) may be useful indicators as well as increases in resting pulse and blood pressure.

Drug Therapy and Psychosocial Treatments Are Additive or Synergistic. The evidence presented above indicates very limited support for a beneficial interaction between antipsychotic drugs and psychosocial therapies on the clinical outcome of schizophrenia. At best, there appears to be little evidence of detrimental effects when these two treatment modalities are combined. However, whereas all the drugs employed in the cited studies have similar mechanisms of action, the same cannot be assumed for psychosocial interventions. The goals of the various individual psychoanalytic psychotherapies, group psychotherapies, day treatments, social and vocational rehabilitations, and family therapies all vary substantially. All seek to maximize psychosocial functioning, but not all these methods aim to minimize florid symptoms in the manner of the drug interventions. Although symptomatic status has received primary emphasis in the foregoing sections of this review, the present section will examine the ability of combined drug and psychosocial interventions to effect beneficial changes in both the clinical and psychosocial status of the patient. Certain drugs, such as pimozide, may be more effective than others in promoting social functioning (Falloon, Watt, and Shephard 1978*b*). Furthermore, when used in conjunction with psychosocial interventions, these "pro-social" drugs enhance the effectiveness of the psychosocial treatment more than other neuroleptics with similar clinical efficacy (Lapierre and Lavallee 1975). Thus, the specific drug chosen, as well as

the specific therapy employed, may be critical to maximize the effectiveness of both.

While there are no reported controlled studies of individual dynamic psychotherapy that *added* significantly to the efficacy of drug therapy, there are several studies of other psychosocial interventions that showed mutual enhancement in combination with drugs. Although flawed by the potentially biased sampling associated with a high rate of patient withdrawal, the study of Hogarty et al. (1974) demonstrated significantly greater improvement for patients who received a combination of drugs and sociotherapy after 18 months of treatment than for those who received only drug therapy. This result, which was found for both clinical and social variables and appeared strongest for male subjects, points to the importance of studying psychosocial interventions over longer time periods and the need to examine the differing outcomes of subgroups within the overall study population.

Claghorn et al. (1974) found no difference on symptomatic outcome for 49 outpatient schizophrenics who were randomly assigned to drug therapy or drug therapy plus group therapy. A battery of psychological tests, however, indicated that the drug-psychotherapy combination was more likely to enhance personal adjustment. Linn et al. (1979) showed that drugs combined with day treatment did not enhance symptomatic improvement brought about by drugs alone, while the combined treatment produced significantly greater improvement of social functioning during a 2-year controlled study. A detailed process analysis revealed considerable variability among the 10 day treatment centers that participated in the study. The best results were achieved in

programs that focused on social and vocational rehabilitation rather than psychotherapeutic counseling. The more behaviorally oriented rehabilitation approaches appeared to enhance psychosocial functioning, without jeopardizing clinical stability. In contrast, the stress generated by psychodynamic therapies seemed to increase the vulnerability to florid exacerbation, and thereby to negate any enhancement of social status. Heinrichs and Carpenter (1982) describe a method of psychodynamic psychotherapy for schizophrenia that attempts to avoid the excessive stressors associated with the traditional application of this model. Controlled studies of this method are eagerly awaited.

A behavioral psychotherapy method that has shown promise is social skills training. This method strengthens the capacity of patients to cope with a broad range of interpersonal situations through repeated rehearsal and practice of the specific social situations that each patient perceives as stressful. Recent innovations have included a cognitive problem-solving component to increase the accuracy of information processing, and to improve the ability to select an optimal response to meet the contingencies of a specific social situation (Wallace 1982). A controlled trial compared social skills training combined with behavioral family therapy with equally intensive holistic health therapy (jogging, yoga, meditation, art therapy) and insight-oriented family therapy (Lieberman et al. 1981). Twenty-eight schizophrenic patients from high "expressed emotion" homes were randomly assigned to 10 weeks of either social skills training or holistic health therapy. All patients were treated on a token economy program in a small inpatient research unit and

received adjusted doses of neuroleptics throughout the study. Upon completion of the program, they were all discharged to standard community care. After 1 year, 21 percent of the social skills training patients had relapsed compared with 50 percent who received holistic health treatment. This difference was not statistically significant. Patients in the holistic group spent more days hospitalized during the 2-year followup period than those in the social skills training. Interpersonal functioning was substantially improved after social skills training, and social adjustment after 9 months favored the behavioral treatment. The stability of these differences despite similar aftercare experiences suggests that the impact of psychosocial interventions may be felt for a considerable time after the end of active treatment.

The combination of individual and family interventions prevented independent assessment of the benefits of the social skills training component alone.

Perhaps the most striking evidence for additive benefits from the combination of drugs with psychosocial treatments has come from the development of family therapy methods based upon the stress-diathesis model. These methods have been unique in psychotherapy research because their development has been conducted in the context of controlled outcome studies.

Goldstein et al. (1978) randomly assigned 96 acute schizophrenic patients to standard (25 mg) or low (5 mg) fluphenazine decanoate biweekly, with or without brief, crisis-oriented family therapy over a 6-week period. The family intervention educated the patient and his family about the relationship between exacerbations of schizophrenia and stress, and identified

strategies for enhanced coping in future. Patients who received the standard dose/family therapy combination were less likely to relapse than those in the other conditions, differing significantly from the low dose/no family therapy condition. Ratings of psychopathology were less impressive, but social withdrawal was reduced with family therapy, a trend sustained at 6-month followup in the group maintained on standard dosage drugs. No assessment of social status was reported.

The low dose of medication combined with family therapy appeared somewhat effective in reducing the risk of florid relapse in the study of Goldstein et al. Thus, one of the potential benefits of psychosocial treatment might be the ability to manage patients on a lower dosage of neuroleptics, thereby avoiding the hazards associated with the administration of these drugs in high doses over long periods.

The apparent benefit for a family-oriented approach derives further support from a study that attempted to minimize the use of neuroleptics in the management of acute episodes of schizophrenia (Mosher and Menn 1978). A supportive family-style residential treatment program, where only 8 percent of the patients received neuroleptic medication, was clinically as effective as standard hospital treatment and community management over a 2-year period. The experimental subjects showed better social functioning, particularly on measures of independent community living and occupational attainment. The studies of Liberman et al. and Mosher and Menn did not control the neuroleptic administration in an experimental fashion, but it is evident that further studies to explore the interactive effects of dosage levels and psychosocial interventions may prove fruitful.

Family interventions that aim to reduce environmental stress, and thereby lower the vulnerability of patients to clinical exacerbation appear to add to the clinical efficacy of drug therapy in schizophrenia. Falloon et al. (1982) randomly assigned 36 patients living in stressful parental households to 9 months of behavioral family therapy or individual supportive therapy of equal intensity. All patients received optimal doses of neuroleptics, determined on a monthly basis by psychiatrists blind to psychosocial assignment. Plasma level estimations of drugs and serum prolactin assays, as well as clinical ratings, were used to determine the minimal feasible dosage on a monthly basis. The family approach employed a detailed functional analysis of current and potential intra- and extrafamilial stresses. Patients and family members were trained to use a structured approach to enhance their collaborative problem-solving effectiveness and thereby minimize the effects of these stresses. Family problem solving was also deployed to maximize the social functioning of all family members. After 9 months, 6 percent of family-treated patients had relapsed, whereas 44 percent of the individually managed had suffered a major exacerbation of schizophrenia. Blind, independent assessments indicated that family-treated patients experienced a more stable course of schizophrenia, with improved social adjustment and more effective family functioning. The benefits of family management were still evident at 2-year followup (Falloon 1983).

A similar reduction in relapse rate was reported in a study in which family management was compared to standard aftercare in 23 patients maintained on neuroleptic medication (Leff et al. 1982). All 23 cases came from high "expressed emotion"

households. The family intervention included education about the management of schizophrenia with varying amounts of family or marital counseling that was intended either to reduce criticism and overinvolved behavior of family members toward the patient or to lower the time spent with high EE relatives. One patient relapsed in the family-managed group, compared to 6 of the 12 patients who received standard aftercare. No measures of social functioning were reported. Preliminary reports of another study that combined education with stress reduction promise similar reductions in the rate of acute exacerbation, although at some cost to reductions in social functioning (Anderson et al. 1981).

It is apparent that approaches that focus on the clinical outcome of schizophrenia owe much to the stabilizing effects of concomitant drug therapy. The provision of a more supportive social milieu with effective problem-solving strategies may substantially improve the efficacy achieved by neuroleptic drugs. In addition, where family members can be trained to assist in psychosocial rehabilitation, the potential for improved functional status may be considerable. These newer family approaches emphasize patient and family education about the management of schizophrenia, and may enable drugs to be used intermittently when the early signs of impending exacerbation become apparent, or when excessive stress can be anticipated (Herz and Melville 1980; Carpenter and Heinrichs, this issue).

Investigators who advocate psychosocial approaches tend to support the view that the beneficial effects of these interventions accrue from stress reduction. However, psychosocial methods frequently deal

with the problem of compliance with drug taking, and it is possible that some of the benefits derive from more effective deployment of neuroleptics in these cases. Such an effect could be considered synergistic. In the Falloon study compliance with oral tablet ingestion was improved by specific strategies worked out by the patient and his family (Strang et al. 1981). This approach enabled two-thirds of the patients to maintain near perfect compliance and to show more stable plasma levels. A potential result of this enhanced compliance and the stress reduction achieved by more effective problem solving was a lower mean dose of drug for family-managed cases. Family therapy patients ingested an average daily dose of 245 mg of chlorpromazine, or its equivalent, compared to 338 mg for patients receiving individual supportive psychotherapy. An analysis of dosage of the two treatment conditions revealed a trend suggesting that the dosage of individually treated patients increased over the 9-month period, whereas family patients tended to remain on a stable low dose throughout, with some tendency to decrease from the stable baseline levels (Mann-Whitney U test = 219.5, $p < .07$).

Maintaining adequate compliance with neuroleptic drug taking is a crucial psychosocial component associated with all drug therapy. This observation serves as a reminder that effective drug therapy is not conducted in a therapeutic vacuum, but requires a trusting, concerned interpersonal relationship between therapist and patient that may extend over many years, and endure the many vicissitudes associated with the course of schizophrenia. Thus, in its most basic form, the optimal management of schizophrenia always involves a combination of drug and

psychosocial components.

Conclusions

There is increasing evidence that psychosocial interventions that are based on the stress-diathesis model of the course of schizophrenia enhance the effectiveness of pharmacotherapy in the long-term treatment of schizophrenia. The ideological battles that sought to contrast the relative merits of drug and psychotherapy have been supplanted by efforts to combine the benefits of both. Selection of the clinically optimal combination is determined through careful assessment of the characteristics of the patient's impairments; his premorbid assets and deficits; potential stressors and supports in the patient's environment; and the pharmacokinetics and dose response of the specific neuroleptic drug associated with each individual patient. Interventions that address specific impairments, disabilities, and handicaps in the patient's functioning, and that provide structured training to enhance the patient's ability to cope effectively in his environment, appear more efficacious than traditional psychoanalytic psychotherapies, and may enable a patient to adjust to community life with less neuroleptic medication, with all the attendant long-term risks such medication entails.

There is some evidence that antipsychotic drugs may sometimes reduce the learning capacity of schizophrenic patients, but this effect is probably only evident when high doses of drugs are used. Some recent findings point to potential advantages of low dose, or even intermittent, medication, especially in combination with stress-reducing interventions. No longer is it sufficient merely to suppress the florid symptoms of schizophrenia.

Drugs alone cannot promote the acquisition of new interpersonal skills or enhance coping behavior. Psychosocial interventions are necessary to improve social competence and to provide efficient rehabilitation of the schizophrenic patient to a functional state in the community. To this end the patient's family may provide a valuable resource. Efforts to involve families in the rehabilitation process appear extremely promising.

Long-term compliance with drug therapy remains a major concern in the management of schizophrenia. Although it is apparent that many of the limitations of pharmacotherapy were misattributed to poor compliance, reliable drug taking is crucial. Psychosocial methods can be successfully employed to improve adherence to a prescribed drug regimen. Effective application of psychosocial treatments requires similar consistent, cooperative participation over long periods. Whereas improvement with drug treatment is usually evident early in the course of the illness, and is most dramatically observed in the reduction of florid symptoms, the benefits of psychosocial interventions accrue more gradually, and are more readily observed in the amelioration of psychosocial disabilities and handicaps. Nevertheless, the changes induced by psychosocial treatment may be no less dramatic when observed over the course of the illness.

The morbidity of schizophrenia is lifelong in many patients. Vulnerability, and associated symptomatic exacerbations and social handicaps, can be substantially modified by modern treatment methods, but effective interventions may need to extend for long periods. Premature termination of drug or psychosocial treatment is a major hazard in the long-term effective management of

this condition. At present, continuous drug therapy appears a necessary, yet not sufficient, strategy in the community treatment of most patients with schizophrenia. Further benefits accrue when psychosocial interventions that are based upon the stress/vulnerability paradigm are added to drug therapy. There is some tentative evidence that enhancing the coping capacity of the patient's support systems may have a synergistic effect on drug therapy to enable lower doses to be employed. This may facilitate withdrawal of long-term drug therapy in a proportion of patients, or permit intermittent administration procedures. Further explorations of the nature of drug-psychosocial treatment interactions are essential to the development of community management programs that seek to minimize the morbidity of schizophrenia.

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