

Psychiatric Aspects of Hemodialysis and Kidney Transplantation

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A series of clinical studies on the psychiatric aspects of hemodialysis and kidney transplantation were done with Korean patients, kidney donors, their families and unit nurses. All subjects were interviewed and evaluated for their psychiatric reactions and symptoms and for the underlying causes.

Depression was the most common reaction, although the clinical features were somewhat different between groups studied. In addition, a unique and episodic psychotic syndrome was found in four patients.

Depression and psychotic episodes seemed to reflect the psychodynamic components such as instinctual frustration, physical, familial and financial loss, dependency on a machine, sensory deprivation and the so-called fear of death and fear of life. These seemed to follow the unique features of hemodialysis and transplantation. The main defense mechanism seemed to be denial.

The possible role of psychiatrists was discussed for evaluation, treatment, and prevention of these reactions and for the support of the family and the treatment team.

Key words: hemodialysis, kidney transplantation, donors, psychiatric reactions, the family, nurses in hemodialysis unit, Koreans.

Since the 1960s, hemodialysis and kidney transplantation have been developed as a radical treatment technique in chronic renal failure (Friedman et al., 1978). Even though these techniques can prolong the life of the patients, they also cause new adjustment problems (Abram, 1977). Early in the history of hemodialysis, internists thought hemodialysis had caused

easy fatigability and loss of stamina in the patients. But soon they noted psychological adjustment problems and neurotic reactions. These were reactive depression, suicidal tendencies, mania, and even rare schizophrenia-like psychotic states (Shea et al., 1965; Abram, 1968; Abram et al., 1971; Retan and Lewis, 1966; Mckegney and Lange, 1971; Procci, 1977; Levy, 1977). The situation is the same with patients on home dialysis, even though it is less

serious (Lowry, 1979). These psychiatric problems are also found in the family, in treatment personnel such as internists and nurses in the hemodialysis unit (Kaplan De Nour and Czaczkes, 1968), and in the whole society, too (short and Wilson, 1969). Recently research interests have focused on the quality of life (Levy and Wynbrandt, 1975; Kaplan De-Nour and Shanan, 1980). For the general well-being of the patients, psychiatric help is needed for the patients themselves and for their families as well. Medical personnel should also be supported in the psychological adjustment for their continuous efficient activities.

In Korea, the number of patients with renal failure who are treated with hemodialysis and kidney transplantation has recently increased. The authors, as psychiatric consultants for the hemodialysis and kidney transplantation program at Yonsei University Medical Center, have noted various psychiatric reactions in patients, in their families, and in the nurses at the units using these new medical techniques. This paper will summarize the clinical data on psychiatric problems of the patients on hemodialysis and kidney transplantation and of their families, along with the adjustment reactions in the nurses at the unit. The authors also have attempted to identify, if any, a unique pattern of reactions to these complicated high-cost medical techniques in Korea.

Psychiatric reactions of hemodialysis patients

Twenty-one hemodialysis patients were evaluated for their mental states and adjustment problems, using structured interviews and rating scales. They were compared with neurotic patients on out-patient treatment in the psychiatric department and with a normal group.

Demographic data is shown in Table 1. Males numbered more than females and ages ranged from 30 to 65, with a mean of 42.4

years. All had suffered from physical discomfort due to chronic renal failure and mental conflict in sexual, familial and financial problems for a period ranging from 3 to 10 years. The duration of dialysis ranged from 1 to 15 months, the mean being 5.9 months.

During hemodialysis, almost all patients showed various degrees of depression, which was characterized by nihilistic and suicidal tendencies, loss of interest, anxiety, hopelessness and insomnia. Two patients attempted suicide at home; one attempt was by hanging, and another attempt was by the sudden withdrawal of shunt connections during hemodialysis.

In addition, half of the patients showed marked irritability and severe guilt feelings. About 30% of the patients showed negativism, memory impairment, and paranoia. A few refused interviews. Some showed smiles, denying any psychological problems. The most apparent common findings were psychomotor retardation and a mask-like dull facial expression. Behaviorally, their dependency and impulsiveness were the most disturbing attitudes for the nurses. Sometimes the patients showed overt sexual-related behavior such as touching or talking to the nurses.

Some of these symptoms (irritability, dull facial expression, confusion and intellectual impairment) could be related to encephalopathy caused by metabolic impairment.

Comparison of the scores of these patients using Zung's self-rating depression scales and Hamilton's rating scales of depression and anxiety with the scores of normal and of neurotic groups are shown in Table 2. Hemodialysis patients showed similarities with neurotic patients. In particular, it was noted that the psychiatrists had rated the hemodialysis patients a higher score in the Hamilton rating scales for depression and anxiety than the neurotic patients. Hemodialysis patients rated a lower score in the self-

Table 1. Demographic data of patients on hemodinlysis in this study

No.	Sex	Age	Marital status *	Education	Religion	Occupation	Months on dialysis
1	M	53	M+5	Primary school	Buddhism	Skilled worker	2
2	M	30	S	Middle school	Protestant	Skilled worker	1
3	M	34	M+2	College	—	Teacher	5
4	F	51	M+4	Primary school	Buddhism	Housewife	1
5	M	41	M+3	College	Protestant	Skilled worker	5
6	M	42	M+4	College	—	Business man	15
7	M	37	M+4	College	—	Skilled worker	2
8	M	25	S	High school	Protestant	Unemployed	10
9	F	31	M+2	College	Buddhism	Business man	5
10	F	44	M+4	High school	Protestant	Housewife	13
11	F	45	M+4	Middle school	—	Housewife	7
12	F	44	M+4	Primary school	Protestant	Housewife	7
13	M	33	S	College	Buddhism	Skilled worker	2
14	F	54	M+4	College	Buddhism	Housewife	1
15	M	31	M+1	College	—	Business man	1
16	M	47	M+5	College	Protestant	Teacher	8
17	M	65	M+6	Primary school	—	Merchant	3
18	M	37	M+3	College	—	Skilled worker	5
19	F	40	M+2	College	Protestant	Housewife	6
20	F	45	M+4	High school	Protestant	Housewife	7
21	F	62	M+1	Primary school	—	Housewife	14

* Numbers in this column indicate number of children

Table 2. Comparison of various score values in each group tested

Groups	Self-rating Depression Scale (Mean ± SD)	Hamilton's Depression Scale (Mean ± SD)	Hamilton's Anxiety Scale (Mean ± SD)
Hemodialysis Patients N=21	53.35 ± 7.41	24.90 ± 7.63	22.90 ± 6.47
Family Members N=22	46.25 ± 11.63		
Neurotic Patients N=30	58.87 ± 5.32	19.86 ± 4.40	20.75 ± 3.92
Normal Control N=30	33.70 ± 6.04		

rating scale than the neurotics. This suggests the possible use of the defense mechanism of denial.

The most significant symptoms revealed in the self-rating scales were depression, nihilistic and suicidal tendencies, loss of interest, psychomotor retardation, hypoactivity, anxiety and

insomnia. Other significant symptoms were irritability, guilt feelings, negativism, paranoia, memory impairment, anorexia and palpitation.

The general symptom patterns are somewhat different between the groups. In the hemodialysis patients, decreased libido, personal

devaluation were the most predominant symptoms, while in the neurotic patients, indecisiveness, sleep disturbance and diurnal variation were more apparent. Generally, female patients showed higher scores than male patients. The more months that hemodialysis had been used, the severer the degree of depression. Many patients hoped that kidney transplantation would stop the endless high cost of hemodialysis. But they could become frustrated again because nobody in the family would willingly donate a kidney, and kidneys from cadavers are not yet easily available in Korea.

A unique psychotic syndrome associated with hemodialysis

During the first two years of our hemodialysis program, a unique type of psychotic syndrome associated with hemodialysis developed in four patients. All were middle-aged males. This syndrome, characterized by acute onset within the first several hemodialysis sessions, lasted two to five days, with sudden recovery and complete amnesia for the episode.

The symptoms began with anxiety and irritability, then rapidly changed to emotional dullness, apathy, mutism, negativism, confusion, paranoia and delusions related to the fear of death. Such a delusion was one patient's belief

that he was already dead, which caused bizarre behavior such as lamentation for his funeral. The whole clinical feature was similar to a mixture of a catatonic state and dissociation.

Some symptoms such as confusion and irritability might be partly due to metabolic disequilibrium during the early dialysis. However, most other symptoms seemed to be the result of the psychodynamic defenses of denial, repression, symbolization, and dissociation against the fear of death. They also resulted from conflict associated with the machinery procedure and their dependence on it, as well as from a lowered quality of life, and a marked loss in their physical, family and social life.

As hemodialysis proceeded, these symptoms improved dramatically in a short time without special treatment. All patients were almost completely amnesic for the episodes, but the chronic neurotic depressive state was persistent.

This syndrome was thought to be different from uremic encephalopathy which develops due to uremia and is characterized by headache, nausea, confusion, agitation, restlessness, intellectual impairment, hypertension, twitching and convulsion as Kennedy et al., (1964) and Halper (1971) have described. It is also different from the so-called chronic dialysis dementia described by Alfrey (1976) and Scheiber and Ziesat (1976) which develops after longer periods of dialysis

Table 3. Clinical course and symptoms of a psychotic syndrome associated with hemodialysis

Course:	1) Prodromal phase of chronic depression
	2) Short period of anxiety and irritability
	3) Sudden onset of psychotic behavior after several hemodialysis sessions
	4) Full recovery after limited duration of two to five days
Symptoms:	Emotional dullness and confusion
	Mutism and negativism
	Irritability or catatonic excitement
	Attempted suicide
	Delusion that patient himself is dead and related bizarre behavior such as lamentation

and is characterized by progressive dementia, mutism, dysarthria, dyspraxia, convulsions and death.

During the study period, two patients showed typical uremic encephalopathy. One patient admitted suffered from insomnia and irritability and was in a semicomatose state. With emergency dialysis, the conscious level improved and gradually the headache also disappeared. No other psychopathology was noted. Another patient showed progressive uremia even though hemodialysis was continued. Dyspnea, headache, and nausea increased and confusion, mutism and psychomotor retardation developed. After coma developed, he died one month after initiation of hemodialysis.

But this unique syndrome developed in the early dialysis period, when uremia was improving after several runs of hemodialysis, while the progressive neurologic impairments had not yet developed. We could not identify any special contributing factors other than psychodynamic factors and possible metabolic changes such as the so-called early disequilibrium state which might weaken the ego function of the patients.

Reactions in the family members

Twenty-two family members (14 housewives, 1 husband, 1 mother, 4 daughters, 2 sisters) of hemodialysis patients were interviewed. A scale for self-assessment of anxiety and depression (SAD) was used. The SAD Score was 46.25 (SD 11.63). The SAD score of neurotic patients was 58.87 (SD11.61). They also suffered from various neurotic symptoms. The most common symptoms were depression and agoraphobia. Others were loss of interests, guilt, late insomnia and daytime drowsiness, while the neurotics complained more of anxiety, tension, agitation, sensitiveness and somatic symptoms. As shown in Table 2, they rated generally lower in the self-rating scale for anxiety and depression

but higher in the items of weeping, less enjoyment of life, early insomnia, and worthlessness. However, they showed far less somatic symptoms. This was a very distinctive feature, since neurotic symptoms in Koreans are characterized by marked somatization (Min and Kim, 1978). They especially complained of dissatisfactions in sexual life and in menstrual dysfunctions. One housewife had suffered from the excessive sexual demands of her husband who was the patient.

The most common etiological factors were 1) conflicts associated with the impending death of the patient, and 2) future uncertainty of family life with marked financial loss. They also suffered from inner conflict: ambivalence and guilt feelings associated with the donation of a kidney for transplantation; the decision of stopping the treatment; and hostility and resentment in the reaction to the long term dependence of the patient, along with their neurotic or even psychotic behaviors.

This reactive depression was more evident when the family members were wives, older in age, and sensitive and obsessive in personality; but less evident when they were less educated, Christians, and extroverted and active in their personalities.

Reactions and adjustment of donors and recipients in kidney transplantation

Preoperative and postoperative psychiatric reactions were evaluated in 23 pairs of donors and recipients of kidney transplantation. Twenty-two of 23 donors were family members of recipients (Table 4). The most common was a sister donating to a brother (7 cases), a mother to a son, a younger brother to an elder brother, and a daughter to parents in that order. While female donors outnumbered male donors, all recipients were males except for one mother. Ten recipients were the oldest sons or the only son. These reflect familial pressure related to

Table 4. The donors, the recipients and their relationship

No. of pairs	Donors (age)	Recipients (age)
1	mother (55)	son (19)
2	mother (58)	son (33)
3	mother (62)	son (44)
4	mother (48)	son (28)
5	father (53)	son (23)
6	father (62)	son (30)
7	elder brother (40)	younger brother (36)
8	elder sister (45)	younger brother (41)
9	younger brother (28)	elder brother (35)
10	younger brother (25)	elder brother (31)
11	younger brother (18)	elder brother (39)
12	younger brother (25)	elder brother (29)
13	younger sister (21)	elder brother (25)
14	younger sister (31)	elder brother (45)
15	younger sister (24)	elder brother (32)
16	younger sister (36)	elder brother (41)
17	younger sister (19)	elder brother (28)
18	younger sister (41)	elder brother (55)
19	younger sister (27)	elder brother (32)
20	daughter (26)	father (55)
21	daughter (22)	mother (51)
22	nephew (30)	uncle (38)
23	non-relative male (55)	non-relative male (33)
Total	Male 9 Female 14	Male 22 Female 1

the traditional custom of male predominance in Korea. However, the donors themselves consciously presented altruistic motivation.

The reluctance to donate a kidney and the fear of injury and loss of an organ were expressed through many neurotic symptoms, somatization, and especially through dramatic dreams. In a typical dream, the neck of a donor brother was cut and the body without a head was buried. He added his concern that the decayed body could not be connected with the head. In a dream of another donor, he was chatting with the family. Suddenly he found himself left alone in a locked room. He knocked on the door but no body answered.

The selection of donors among family members is a very complicated procedure in addition to immunological matching, and has caused covert hostility, tension, anxiety, and depression in each family member. In most cases, unmarried younger family members are emotionally pressured to volunteer.

In the donors, the preoperative symptoms such as anxiety and tension and many somatic symptoms improved after the operation, as shown in Table 5. Scores of Hamilton's scale for anxiety and depression improved respectably from 18.44 (SD 6.43) to 16.19 (SD 5.82) and from 16.13 (SD 3.42) to 15.69 (SD 4.72). However, hypochondriac tendencies, depression, and

Table 5. Changes in mean scores of Hamilton's scales for anxiety and depression in donors and recipients in kidney transplantation before and after operation

	Hamilton's Scale	Before Operation Mean \pm SD	After Operation Mean \pm SD
Donors N = 23	For anxiety	18.44 \pm 6.43	16.19 \pm 5.82
	For depression	16.13 \pm 3.42	15.69 \pm 4.72
Recipients N = 23	For anxiety	19.0 \pm 5.12*	16.81 \pm 7.70*
	For depression	22.8 \pm 7.60*	18.0 \pm 4.18*

* P<0.05 in two tailed t-test

hostility did not improved as much.

Most recipients had already suffered from chronic depression associated with chronic renal failure and the complicated hemodialysis procedure. Confronted with the new problem of the donation of a kidney and the expensive cost of the operation, their depression became more complicated by guilt feelings, hostility, resentment and fear of death. These conflicts were expressed through many neurotic and somatic symptoms and even paranoiac tendencies. After the operation fewer recipients than donors showed improvement. Scores of Hamilton's scales of anxiety and depression improved respectably from 19.0 (SD 5.12) to 16.81 (SD 7.70) and from 22.8 (SD 7.60) to 18.0 (SD 4.18). This improvement was statistically significant ($p < 0.05$). However, hostility, guilt feelings and paranoid tendencies improved very little. After a short period of hope for a new life and a good physical condition, most patients began to have anxiety for possible rejection phenomena, which influenced the postoperative prognosis seriously. A 28 year old male, who was given a kidney from his mother, developed an acute psychotic episode on the second postoperative day. He showed excitement and agitation, suffered from insomnia, and bit his tongue. He insisted that he was all right, that he had no disease, that he could do anything, even walk. After 2 days, the symp-

toms began to improve.

As a whole, the donor's postoperative prognosis was better when the donors were females, married, the parents of recipients, and at a lower socioeconomic level. The prognosis was better for the recipients when they were older and were the parents or children of donors, when they were at a higher educational level, and particularly when rejection phenomena was less likely to occur.

Adaptational Process of the Nurses in the Hemodialysis Units

Sixteen nurses working at two hemodialysis units were interviewed for psychiatric assessment of their adaptational problems associated with the hemodialysis procedure. They were all female nurses in their twenties who had worked at the units for a period ranging from 1 month to 5.5 years, the mean being 22.6 months. MMPI and self-rating scales for anxiety and depression were compared with other age and sex matched groups of nurses working in the general wards.

Most of them had started their work with enthusiasm and empathy. Gradually, however, as they confronted the monotonous environment of the hemodialysis units, the depressive mood, dependency, and the demanding attitude and impulsive behaviors related to the repressed in-

instinctual needs of their patients (for example, sexual), they began to feel anger, frustration, guilt, depression and finally indifference. These poor adaptations had caused obsessiveness, increased sensitivity, hypochondria and somatization reactions in half of the nurses. The content of their hypochondria was their concern that they might have a renal disease. Only three nurses reported successful adaptation.

All the nurses believed that psychiatric help is needed for chronic hemodialysis patients. They developed their own supportive psychotherapeutic techniques, combined with their routine medical nursing care, which included an empathetic attitude, clear explanations on the need of treatment, and advice on personal and family problems. However, they believed that these could be done better by psychiatrists.

Comments

The psychopathological reactions have been studied and discussed in various aspects in which physically ill patients showed reaction to chronic stress or impending death. At the hospital these reactions could sometimes be found in the emergency room, the intensive care unit and the hemodialysis unit. These reactions if not properly treated in time, might result in serious problems, such as suicide or psychotic destructiveness.

Psychiatric disorders which are found in patients with chronic renal failure undergoing hemodialysis can be divided into two categories: 1) the brain syndrome associated with uremia or other metabolic changes and 2) the psychological reaction to the chronic stress and hemodialysis procedure itself. The former is characterized by fatigability, apathy, changes in consciousness, tremor, irritability, confusion, intellectual impairment, hallucination, delusion, other psychotic symptoms and related neurologic impairments such as EEG abnormalities, dyspraxia, convul-

sion, and progressive dementia. These syndromes of organic origin have been identified as uremic encephalopathy (Dale, 1975), so called disequilibrium syndrome (Wakim, 1969) and chronic dialysis dementia (Alfrey et al., 1976; Scheiber and Ziesat, 1976). Razas et al., (1978) suggested that this dementia is related to aluminium intoxication. Among the psychological reactions, depression is known to be most frequent. A few cases of psychotic reaction were also reported (Shea et al., 1969; Abram, 1968; Abram et al., 1971).

The factors which were known to contribute to this depression and other psychological reactions in hemodialysis patients were: 1) frustration in instinctual needs such as eating and sexual drive (Levy & Wynbrandt, 1975; Abram et al., 1975; Wright et al., 1966), 2) anxiety and fear associated with blood and injury (Wright et al., 1966), 3) serious feeling of loss in physical activities, family life and financial aspects (Levy and Wynbrandt, 1975; Wright et al., 1966), 4) a kind of mourning process (Cramond et al., 1967), 5) helpless feelings that their lives are dependent on a machine (Kempf, 1967), 6) lowered quality of life (Levy and Wynbrandt, 1975) and 7) the sensory deprivation state in the environment of the hemodialysis unit (Shea et al., 1975; Abram, 1968).

This situation has been described as "dependence-independence complex" and "giving-up-given-up complex" (Engels, 1968); or "fear of death, fear of life" (Beard, 1969). The patients mainly use the defense mechanism of denial (Beard, 1969; Short and Wilson, 1969) against this anxiety and conflict. This coping behavior was explained as grief work or death work (Reichsman and Levy, 1972) or regression to a pregenital stage (Kaplan De-Nour, 1969).

Factors associated with a good prognosis were: 1) the patient's capacity to adaptively regress to a state of dependence without conflict,

2) a strong religious belief, 3) the continued presence of one or both parents, 4) a mean low blood urea nitrogen level, and 5) indifference to fellow patients (Levy and Wynbrandt, 1975; Foster et al., 1973).

Suicidal tendencies may be the most serious problem, and psychiatrists should intervene and help prevent this problem. Unit doctors and nurses, as well as consulting psychiatrists, should be alert to even minor signs of suicidal tendencies by the patients. These signs may be simple negativism such as passive uncooperativeness to various medical procedures, including diet. All members of a treatment team should maintain good relationships with patients. They should be open-minded and willing to discuss any inner conflicts of their patients on both an individual or group basis (Reichsman and Levy, 1972; Hollon, 1972).

The dialysis patients usually hope for the prolongation of life by kidney transplantation, but they also have to confront the new dilemma of who will voluntarily donate a kidney (Simmons et al., 1971). After the operation they have to confront the rejection phenomena of a transplanted organ. Donors also have a serious conflict associated with loss of an organ and injury (Kaplan De-Nour and Shanan, 1980). Therefore, the selection of a donor from among family members can be a very complicated procedure. One of the authors had a patient who became psychotic when her husband was selected as the donor by his family. A clinical study of donors and the meaning of kidney donation will be published elsewhere.

Comparing related literature from western countries, the reactions and symptoms of Korean patients and their family seem to be influenced by the cultural and social situation found in Korea. First, the donation of a kidney only by family members seemed to cause a more serious conflict to both donors and recipients in the long term psychological adaptation. Second, the

more marked trend of somatization is characteristic in Korean patients. This trend among Koreans has been discussed by some Korean psychiatrists, including one of the authors, but will not be discussed here. However, exceptionally less somatization in the family members reflects that selection of symptoms is dynamically influenced. This means that the clearly evident exogenous factors will cause less somatization than the neurotic disorder usually will. Third, the financial problem is a serious one in Korean society. Now, many suicides are attempted due to the patient's belief that the family money should not be wasted. Insurance systems are not yet developed enough to cover hemodialysis and transplantation in Korea.

A brief psychotic episode as described here was not found in other literature, though the search for literature may not have been exhaustive. The uniqueness of this syndrome is evident from the fact that the psychotic symptoms of schizophrenia can be alleviated by hemodialysis (Wagemaker and Cade, 1977; Stretzer et al., 1977; Port et al., 1978). The development of such a dramatic episode seemed to be influenced by a poorly equipped environment and by inexperienced nursing in the early period of our program development. Now, after 5 years of experience and improvement in skillful nursing and in the physical environment of the hemodialysis unit, such a case is rarely found.

These findings suggest that in chronic hemodialysis, a multimodal approach which includes psychiatric intervention is essential for the whole treatment procedure of supporting the treatment personnel as well as the patients. Psychiatrists can assist in the decision making process in regard to the patients with renal failure by helping them to fully adapt to the stresses of prolonged treatment by the technique of hemodialysis; by treating those who develop psychiatric reactions during therapy; by assisting

and aiding the family; by evaluating and supporting the donor and others involved in that network when renal transplantation is planned; and by supporting the treatment personnel. The role of a psychiatrist as a member of the team is now being studied in this social context in Korea.

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