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Psychoanalysis and diabetic control: A single-case study

George Moran and Peter Fonagy

INTRODUCTION

The relationship of hypothesis and evidence in psychoanalytic case reports has never satisfied the canons of eliminative inductivism. Grünbaum's (1984) critique of the epistemology of psychoanalysis aimed to show that the clinical data of psychoanalysis were irretrievably contaminated by persuasive suggestions to a patient in a vulnerable regressed state under the influence of strong positIve transference. Many, including some psychoanalysts, have accepted that the psychoanalytic situation is not capable of providing evidential support for psychoanlytic hypotheses according to the generally accepted criteria of modern science and have abandoned Freud's claim for psychoanalysis to have a legitimate place in the domain of natural sciences (Fonagy, 1982).

A number of psychoanlyts, however, have decided to take up Grünbaum's challenge (e.g. Edelson, 1986; Wallerstein, 1986). These authors claim that psychoanalytic hypotheses can be, and in the case of many hypotheses can only be, tested within the methodological requirements of eliminative inductivism. Edelson's suggestions include the use of quasi- experimental designs derived from single-subject research, the use of causal modelling and statisical controls, suggestion-resistant measures of the analysand's response, the use of explicit operational criteria for the classification of the analysand's material, and the use of reliable rating scales which permit the assessment of the probable presence of specific clinical themes. The present paper aims to take an initial step towards applying these recommendations to the investigation of the relationship between insight derived from psychoanlalytic treatment and symptomatic improvement.

The hypothesis under investigation concerns the value of insight into unconscious conflict for the alleviation of neurotic symptomatology. Past systematic investigations have failed to provide support for the assumption that symptomatic improvement in psychoanalysis in commensurate with insight obtained. Wallerstein (1985), for example, reports on the therapeutic outcome of 42 patients in psychoanlytic and psychotherapeutic treatment within the Menninger Psychotherapy Research Project. Improvement in these patients, whether in psychoanalysis or psychotherapy, was apparently independent of the extent or depth of the insights they obtained in either form of treatment. This and similar studies, however, used between-subject quasi experimental designs to test the hypothesis that patients who showed the most marked improvement were those who gained most in terms of self-understanding. In evaluating the results of such studies, it is important to bear in mind Gottman's (1973) cautionary note concerning the potentially misleading results which follow from averaging data across individuals in psychotherapy outcome research. For example, the extra therapeutic attention directed towards patients inherently resistant to improvement may lead them to manifest greater insight but little or no therapeutic change. Confounding factors such as this make comparisons across individuals difficult to interpret.

We think that evidential support for the notion of insight-based symptomatic improvement is more likely to be gained from the detailed systematic study of the individual case. Thus, we aimed to test the hypothesis that there is a relationship between insight into unconscious conflict and the amelioration of neurotic symptoms over the course of a psychoanalytic treatment employing a single-case design. Using a probabilistic framework, we predicted that improvements in symptoms would occur in temporal association with psychoanalytically derived insight. Furthermore, psychoanalytic theory required that conflict resolution could be demonstrated to precede symptomatic improvement.

The psychological treatment of individuals with poorly regulated diabetes mellitus provides a useful opportunity for the investigation of the relationship between the resolution of neurotic conflict through psychoanalysis and symptomatic improvement. Insulin-dependent diabetes mellitus is a chronic metabolic disease which results in the diabetic patient's inability to metabolize carbohydrates. The treatment regimen aims

to re-establish the delicate balance between carbohydrate intake and the insulin required to convert sugar into cell energy. The diet must be precisely regulated and timed in conjunction with injections of insulin. In order to achieve blood glucose control, levels of blood sugar and energy output (physical exercise) must be carefully monitored. The patient is thought to be in good diabetic control when levels of blood glucose approximate the normal range for non-diabetics.

A small group of diabetic patients have very serious problems regulating their blood glucose levels (brittle diabetes). Their lives are constantly disrupted by episodes of hypoglycaemia and/or hyperglycaemia (Tattersall, 1985). These patients often have a history of repeated admission to hospital for treatment of life-threatening episodes of severe metabolic derangement, i.e. hypolglycaemic coma and.or hyperglycaemia leading to diabetic ketoacidosis. Diabetologists are in agreement that the aetiology of brittle diabetes is psychological rather than organic (Schade et al., 1985).

The psychological mechanisms which bring about the life-threatening conditions associated with brittle diabetes require clarification. We propose a psychoanalytic model of this disorder which the present single-case study aims to validate. There are two fundamental assumptions which underlie the model we propose. The first is that psychological variables are causally related to fluctuations of diabetic control and the second is that these fluctuations are brought about by the conscious and unconscious performance of acts inconsistent with successful management of the disease. We understand such gross transgressions of the diabetic regimen which underlie certain cases of brittle diabetes to be a neurotic response to the anxiety and guilt aroused by unconscious conflict. Thus, it is the child's adptation to conflict through mismanagement of the diabetic treatment regimen which causes brittle diabetes. It follows from these assumptions that interventions at the level of psychological antecedents may bring about favourable changes in the quality of the management and control of the disease. The intervention which we recommend addresses the preconscious sources of the child's anxieties: the child's conflicts are verbalized and the way in which diabetic mismanagement expresses or serves to divert a child's attention away from repudiated wishes is interpreted. For example, a diabetic child may unconsciously perceive the symptoms of poor diabetic regulation as a punishment for repudiated wishes. Therapeutically derived insight enables the child to

identify the conflictual unconscious wishes which bring about the need for self-punishment via deliberately induced diabetic imbalance. More generally, through psychoanalysis the child may gain insight into the functions which diabetic regulation subserves, or the needs which it represents (Moran, 1984).

We think that evidential support for the notion of insight-based syptomatic improvement is more likely to be gained from the detailed systematic study of the individual case. Thus, we aimed to test the hypothesis that there is a relationship betwwn insight into unconscious conflict and the amelioration of neurotic symptoms over the course of a psychoanalytic treatment employing a single-case design. Using a probabalistic framework, we predicted that improvements in symptoms would occur in temporal association with psychoanalytically derived insight. Furthermore, psychoanalytic theory required that conflict resolution could be demonstrated to precede symptomatic improvement.

The present paper is an attempt to validate this model in a systematic single-case study of the relationship between diabetic control and the pattens of conflicts and symptoms over the 3 1/2 year course of five times weekly psychoanalysis of a diabetic teenager.

CASE HISTORY

Diagnosed diabetic at age 8, Sally was referred for psychoanalysis at the age of 13 because of long-standing physical and emotional problems which had failed to respond to psychiatric and medical treatment over the previous five years. She was consciously and profoundly dissatisfied with being a girl and had a difficult and ‘enmeshed’ relationship with her mother. One of her most prominent difficulties, her fear of attending school, preceded the onset of the diabetes by two years. Her anxieties were, however, aggravated by frequent admissions to hospital with hypoglycaemia and hyperglycaemia. In the five years preceding the analysis Sally was admitted to hospital, most often with diabetic ketoacidosis, between two and five times per year. She was a highly intelligent (WISC-R full scale IQ = 130) resourceful girl. She was in child psychoanalysis five times a week for 3 years.

Aims of the study

The study aimed to examine the association between diabetic control and the variation in the themes of the psychoanalysis. Diabetic control throughout was estimated on the basis of twice daily urine testing. The content of the psychoanalysis was assessed by independent ratings of the analyst's weekly reports. During the course of the analysis Sally rarely talked of the results of tests for monitoring her diabetic balance. The analyst thus had only sporadic and inaccurate information concerning Sally's diabetic control.

Time-series analysis (Box & Jenkins, 1976) was used to examine the relationship between diabetic control and psychological conflict. This procedure permits the drawing of casual inferences by statistically describing the fluctuations, cycles and trends of two processes: the psychoanalytic themes on the one hand and the measure of diabetic control on the other. If the two processes are uncorrelated, it is unlikely that they are causally connected. Concomitant variation, however, would imply causation if fluctuations in one process are predicted by fluctuations in another. We may then legitimately make a relatively weak causal inference compared to the more robust causal inferences which may be made on the basis of experimental designs.

Content analysis and ratings of the treatment

The progress of Sally's analysis was detailed in weekly reports. The reports contained a summary of the major themes of the week and illustrations of the patient's difficulties and anxieties, the therapist's mode of intervention, and the patient's responses. The weekly reports were themselves based on daily reports written after each session. The latter contained verbatim reports of the patient's presentation of herself in treatment, and an account of how the material was clarified, interpreted or simply registered by the analyst. The prominent themes of the daily reports, which were judged to be most relevant to the patient's experiences and the therapist's understanding and technique were then summarized by the therapist in weekly reports of approximately 1000 words.

The 148 weekly reports were condensed in a clinical paper and this report was then studied with a view to extracting the major analytic themes of the case. Analytic themes were identified, which could be judged as present or absent in any particular weekly report over the course of the analysis. An original list of 18 clinical

dimensions was drawn up and operational definition of these was attempted. Although we were successful in devising operational definitions in the case of 10 analytic themes, crucial aspects of Sally's psychopathology and the analytic process defied our attempts at systematic definition and categorization.

Five of the analytic themes were categorized on the basis of the clinical report to be part of the pathological structures (intra-psychic conflicts) underlying diabetic mismanagement. These conflicts concerned Sally's feeling unloved by her father and angry with him for his lack of responsiveness and her associated frustration of the wish to be loved, admired and valued by him, her rivalry with her mother for her father's love and attention, her ambivalence towards her mother deriving from the experience of her mother's psychiatric illness when she was aged 6, her anxiety and guilt feelings over her death wishes towards her parents and other family members in whom she felt disappointed and, finally, her conflicts concerning the threats associated with diabetes, both reality-based and as distorted by defensive processes. A second set of analytic themes of comparable prominence in the treatment referred to material taken up by discussions of Sally's symptoms. These included Sally's imitation of boys and related fantasises, her phobic anxiety in connection with attending school, her imagined or actual intention to punish herself, fantasies concerning a view of herself as being physically damaged, and manifestations of resistance to therapeutic progress in the analysis. Operational definitions were formulated for each of the categories to facilitate the rating of the presence or absence of each theme in each weekly report. An example of the operational definitions of two of the analytic themes, one related to intra-psychic conflict and the other to symptoms, is presented in Table 9.1.

The independent raters of the weekly reports were instructed to read the summary report describing the analysis as a whole before rating the separate weekly reports. This was thought to be necessary in order to familiarize the raters with the therapist's overall understanding of the case, the details of the patient's worries and the metaphors she used to express herself. The two independent raters, both of whom were child analysts, were then asked to rate a random selection of five weekly reports. Ratings were performed on a five-point scale: 'definitely present', 'probably present', 'possible present', 'probably absent' and definitely not present'. The ratings were

compared with the therapist's ratings and agreements and disagreements were discussed. This aspect of the procedure was then repeated on a second random group of five weekly reports.

Table 5.1. Clinical dimensions: Operational definitions and examples

Clinical Dimension		Operational definition	Examples
(1)	Diabetes as an expression of psychic conflict	The patient's experience of diabetes including the diabetic regimen, fluctuations in diabetic control, worries about the future effects of the illness and the encroachment of such concerns on the capacity psychically to represent conflicts and feelings	
		- Diabetic identity	- Interpretation of patient's conflict about wearing 'Medic Alert' necklace _Interpretation of patient's fear of blindness
		- Diabetic control	- Report of worry about hypoglycaemia - Verbalization or interpretation of worry about long-term effects of hyperglycaemia (e.g. cardiovascular complications of the disease)
		- Diabetic regimen	- Report on verbalization of resentment of injections
		- Diabetes as a metaphor for psychic conflict	- Interpretation of worry about being 'low', i.e. hypoglycaemic, to defend against depressive affect or disappointment
(2)	Deliberate self-punishment	Patient's conscious or unconscious intention to hurt, punish or damage herself in response to the experience of succeeding or fantasies which entail desired achievements	

Table 9.1. (cont)

Clinical Dimension	Operational definition	Examples
	- Instances of self-defeating behaviour	- Report of wilful refusal to write correct answers on school exams - Memories and reports of goading mother to restrict patient's activities by arousing mother's anxiety about diabetic control
	- Acts perpetrated on the body	- Report of inducing hypoglycaemia - Report of wilful carelessness while cooking
	- Anxiety in response to success	- Report of anxiety following success in school examinations

The independent raters' and the therapist's ratings of the 10 clinical dimensions for each of the 148 weeks were obtained. The correlations between the three raters were computed using Pearson's product moment correlation coefficients. The inter-rater correlations were moderate to high, with more than 60 per cent of correlations above 0.65. Three of the analytic themes (conflicts over murderous wishes, and the symptoms of a damaged self-representation and resistance to the analysis) had mean inter-rater coefficients of less than 0.6 and were excluded from further analysis. The average inter-rater correlations for the seven remaining themes ranged from 0.78 to 0.62 with a mean of 0.70.

Time series analysis requires a continuous series of observations. Ratings of the analytic themes during brief interruptions of the analysis (up to two weeks) were estimated using an auto-correlational technique which utilizes the immediately preceding observations to predict missing values. This procedure is generally regarded as appropriate when missing values occur in a regular sequence (Thrall & Engleman, 1981). (Altogether 19 weeks or 11 per cent of the series were estimated following this procedure.) There were no missing observations for urine glucose.

Diabetic control was assessed in terms of weekly urine glucose content over the 148 weeks of Sally's analytic treatment and the two preceding years. Although home urine testing is regarded as an inaccurate index of blood glucose control with substantial inherent limitations, its adequacy depends on the characteristics of the patients tested, their renal thresholds, the accuracy of measurement and record keeping and the

reliability of informants. Sally's urine charts were meticulously kept by her mother and Sally. In order to assess the quality of control for each of the 288 relevant weeks, 14 tests per week (the specimen before breakfast and the evening meal for each day) were examined and the percentage of tests showing less than 1 per cent of glycosuria was computed (Ludvigsson, 1977). This yielded weekly averages of negative urine glucose tests ranging from 8 to 100 per cent with a standard deviation of 22.6 per cent. Thus, an increase in the percentage of negative urine tests per week represents an improvement in blood glucose control and, conversely, a decrease of the index of glycosuria represents a deterioration of diabetic control. To validate this index the correlation between all available random blood glucose measures taken at the hospital over the period of the psychoanalysis and the corresponding weekly index of glycosuria was computed yielding a Pearson product moment correlation of 0.84 (d.f. = 7, $P < 0.005$).

Results

The association between diabetic control and the therapist's ratings of the seven reliable psychoanalytic themes was calculated and six of the seven correlations reached statistical significance (see Table 9.2). The highest correlation with urine sugar levels was of the variable concerned with Sally's feeling unloved by her father and her conflict deriving from anger with him. This implies that during periods in which Sally's feeling unloved and in conflict about her anger with her father were prominent in the analytic work, glycosuria tended to be low.

Table 5.2. Correlation coefficients between urine glucose measures and ratings of analytic themes over 167 weeks

Variables	Correlation coefficients	Significance (P <)
Conflicts		
1. Feeling unloved by father and angry with him	0.41	0.001
2. Oedipal conflict	0.26	0.001
3. Diabetes as an expression of psychic conflict	0.15	0.04
4. Conflicts associated with the experience of mother's breakdown	0.06	n.s
Symptoms		
5. Phobic anxiety	-0.15	0.04
6. Imitation of boys and related fantasies	0.14	0.05
7. Deliberate self-punishment	0.27	0.04

Oedipal conflict showed a smaller but still significant positive association with good diabetic control. Finally, the identification of the intertwining of diabetes with other areas of psychological conflict was also positively associated with improvements in diabetic control in terms of glycosuria. One of the conflict dimensions, conflicts associated with the experience of mother's breakdown, was not significantly associated with glycosuria.

In contrast with the analytic themes concerned with the presence of psychic conflict in the analysis, the association of Sally's symptoms with diabetic control was predominantly negative. The association between phobic anxiety as manifest in the psychoanalysis and glycosuria was significant and negative. This implies that weeks during which Sally's material evidenced an irrational fear of persons or situations, urine glucose was relatively high. A negative association was also found between glycosuria and Sally's symptom of imitating her male objects. The symptoms of deliberate self-punishment showed a positive correlation with urine glucose which

was of greater magnitude than the relationship between glycosuria and the other two reliable symptoms. This implies that during weeks in which the analyst and patient spoke about Sally's tendency to hurt and punish herself, urine glucose was relatively low.

In order further to examine the nature of the relationship between urine glucose and the analytic themes noted above, lag correlation coefficients were computed between glycosuria and the rating of psychoanalytic themes. For example, in looking at the dimension concerned with Sally's feeling unloved and in conflict about her anger with father, we wished to know if the emergence of this material tended to precede improvements in diabetic control or conversely whether an improvement in diabetic control ushered in changes in the nature of the analytic material.

The computation of lag correlations requires the removal of trends (gradual shifts or drifts in the data). This is achieved by the subtraction of the preceding observation from the current one throughout the time series. After thus modifying the data, what remains are the week-to-week fluctuations of diabetic control and analytic themes independent of the general improvement in Sally's diabetic control and analytic themes independent of the general improvement in Sally's diabetic status over the course of the analysis and the expectable differences in the predominance of particular themes in particular phases of the analysis. Cross-lag correlations can then be computed to examine if variations in analytic themes were concurrent with (lag of zero), or were predicted by, measures of glycosuria taken one, two or more weeks previously (positive lags of one, two or more). Alternatively, if fluctuations of glycosuria were predicted by the presence or absence of particular psychoanalytic themes one or more weeks previously, correlations at negative lags would be expected. Cross-correlations were computed between the two differenced series at lags of between plus and minus four weeks.

Table 9.3 indicates that when cross-correlations were examined symptoms and conflicts were found to have a different direction of association to glycosuria. Two conflicts had a significant relationship to the index of urine sugar at negative lags. The verbalization and interpretation of Oedipal conflict in the psychoanalysis was associated with reduced glycosuria (i.e. an improvement in diabetic control) two to

four weeks later. The related conflict concerning anger with father showed a similar relationship at a lag of minus one week.

Table 5.3. Cross-correlation coefficients (and standardized estimates) between analytic themes and index of glycosuria at lags of -4 to +4 weeks

	Analytic themes predicting glycosuria				Glycosuria predicting analytic themes				
Weeks:	-4	-3	-2	-1	0	1	2	3	4
Conflicts									
Feeling unloved by father and angry with him	0.01 (0.13)	0.03 (0.39)	0.12 (1.55)	0.17[a] (2.20)	0.19[a] (2.46)	0.09 (1.17)	0.04 (0.04)	0.08 (1.03)	0.11 (1.40)
Oedipal conflict	0.15 (1.91)	0.27[a] (3048)	0.19[a] (2.45)	0.10 (1.30)	0.13 (1.69)	0.04 (0.52)	-0.02 (0.25)	-0.05 (0.64)	-0.10 (1.28)
Diabetes as an expression of psychic conflict	0.10 (1.28)	0.03 (0.39)	0.04 (0.52)	0.09 (1.17)	0.07 (0.91)	0.10 (1.30)	0.10 (1.29)	0.06 (0.77)	0.07 (0.89)
Conflicts associated with mother's breakdown	0.00 (0.0)	0.05 (0.64)	0.02 (0.20)	-0.06 (0.78)	-0.12 (1.56)	-0.15 (1.94)	0.00 (0.00)	0.08 (1.03)	0.01 (0.13)
Symptoms									
Imitation of boys and related fantasies	0.04 (0.05)	-0.08 (1.03)	0.01 (0.13)	0.09 (1.17)	0.13 (1.69)	-0.03 (0.39)	-0.07 (0.90)	-0.03 (0.39)	-0.06 (0.77)
Phobic anxiety	0.10	0.07	0.03	0.01	-1.05	0.02	0.11	0.23[a]	0.25[a]

	(1.28)	(0.90)	(0.39)	(0.13)	(0.65)	(0.25)	(1.42)	(2.97)	(3.19)
Deliberate self-	0.08	0.09	0.11	0.10	0.10	0.13	0.25 [a]	0.24 [a]	0.24 [a]
punishment	(1.02)	(1.16)	(1.42)	(1.30)	(1.30)	(1.68)	(3.23)	(3.09)	(3.06)

[a] Statistically different from zero

By contrast, two of the three symptoms showed a correlation with glycosuria at positive lags. This implies that following improvements in diabetic control, Sally experienced an exacerbation of her phobic reactions and her tendency to punish and hurt herself deliberately. The time lags at which these associations were most prominent were three to four weeks and two to four weeks respectively (see Table 9.3).

We may more rigorously examine the temporal association between psychoanalytic themes and glycosuria by constructing statistical models to describe their relationship. Transfer functions (the statistical model used originally described by Box & Jenkins, 1976) have been recommended for *n* = 1 psychotherapy research (Gottman, 1981; Barlow & Herson, 1984). This statistical model is conceptually analogous to multiple linear regression. It allows us to identify what part of the variation in a continuously evolving dependent variable (glycosuria) may be explained by fluctuations in analytic themes, independent of the predictable fluctuations of glycosuria across time. We attempted to construct such a model for each of the psychoanalytic themes. In two of the models psychoanalytic themes reached statistical significance as independent predictors of glycosuria when regular fluctuations in urine glucose were statistically controlled for.

The first model shown in Table 9. 4 represents a statistical description of the association between Oedipal conflict and glycosuria. The first two components of the model refer to the variability in glycosuria which may be predicted on the basis of past observations of glycosuria one and two weeks previously. The third component represents the rating of Oedipal conflict in the psychoanalytic material which is

shown independently to predict glycosuria over the three weeks following its ratings in the analysis. The second model concerned the analytic theme of diabetes as an expression of psychic conflict. Ratings of this conflict also predicted fluctuations of glycosuria independently of the regular fluctuations in the latter variable over the somewhat smaller time lag of one week. The models accounted for 46 and 33 per cent of the variation in glycosuria respectively.

Table 5.4. Transfer functions for Oedipal conflict and diabetes (causer variables and the index of glycosuria (effector variable)

Variable	Lag (weeks)	Estimates	Standard error of the estimates (d.f. = 160	*t* ratio	P <
Model 1 [a]					
Oedipal conflict	3	4.14	1.3	3.2	0.005
Glycosuria	1	0.67	0.07	8.9	0.001
Glycosuria	2	0.21	0.07	2.8	0.01
Model [b]					
Diabetes as an expression of conflict	4	0.83	0.32	2.4	0.02
Glycosuria	1	0.16	0.05	-3.2	0.005
Glycosuria	2	0.78	0.05	16.1	0.001

[a] Total percentage of variance accounted for by Model 1 + 46.

[b] Total percentage of variance accounted for by Model 2 = 33.

DISCUSSION

Our study had three aims. Firstly, we intended to demonstrate that psychoanalytic data may be organized and examined in a way that is consistent with the canons of eliminative inductivism. Secondly, we aimed to test our hypothesis concerning the value of specific psychoanalytic insights in the dissolution of neurotic structures. Thirdly, we hoped to utilize this method of investigation to elaborate the neurotic processes underlying brittle diabetes. These three ambitions were in part fulfilled by the study.

The findings demonstrated that the working through of psychic conflict predicted an improvement in diabetic control, both in the long and in the short term. The association of analytic themes and the measure of diabetic control over the entire period of the psychoanalysis is of limited importance, as the association may be accounted for in terms of common long-term trends. The association in the short term, when common underlying trends were removed, is of far greater theoretical interest. Grünbaum (1984) argues that symptomatic improvement in association with insight may be totally accounted for by the intensification of the analyst's demand on the patient for improvement in association with self-understanding. Whilst it may be argued that the analyst unwittingly and consistently made such demands on Sally, it is very difficult to imagine how he could have made a consistent demand on Sally to improve blood glucose regulation in the absence of knowledge of her diabetic control. Yet, relevant analytic material was found regularly to precede changes in glycosuria. Furthermore, the temporal relationship of Sally's symptoms and glycosuria, although not initially predicted, is highly consistent with the psychoanalytic theory of neurosis and ill fits Grünbaum's model of the pschoanalytic process. Temporary improvements in Sally's diabetic control were regularly followed by an increase in other neurotic symptomatology. The increase in phobic avoidance and deliberate self-harm consequent upon improvement in diabetic control may be understood as a dynamically meaningful reaction, reflecting the patient's relative incapacity to tolerate states of well-being. We may assume that during certain phases of the analysis, particularly during its early years, good blood glucose control could only be achieved through temporary inhibitions which exacerbated psychological conflict and led to a significant intensification of other psychological symptoms. A non-dynamic account of such a temporal association is difficult to formulate.

Thus, overall, the findings lend some support to the Freudian model of therapeutic change. The support, however, is limited. It could be argued that emotional responses associated with insight reather than insight per se were primarily responsible for changes in blood glucose control associated with analytic themes. A number of workers (e.g. Hinkle & Wolf, 1950; Baker et al.,1969; Minuchin et al,1978) have demonstrated that metabolic balance may be adversely affected by the physiological concomitants of emotional arousal, particularly anxiety. It is plausible that a relative reduction in anxiety associated with the interpretation of unconscious conflict rather

than the interpretation of unconscious conflict per se accounts for the temporal association of psychic conflict and glycosuria. Further studies are needed to examine this possibility. Even if emotional reaction to interpretation was shown to be the critical variable mediating the short-term effects of psychoanalysis on diabetic control, the long-term trend for such reactions to decrease as a result of psychoanalytic treatment could not be denied.

A more serious limitation of the technique we adopted concerns our inability to operationalize some psychoanalytic themes which we regarded as potentially crucial to the understanding of Sally's improvement. These included the maifestation of Sally's relationship to her parents and brothers as these emerged in her relationship with her analyst. Similarly, the relevance of psychoanalytic interventions which addressed experiences and conflicts from earlier phases of Sally's development to changes in diabetic control could not be investigated because the material available did not lend itself to operational definitions or quantitative ratings. It should be emphasized that the present study is viewed as an initial step towards the increased systematization of the treatment of psychoanalytic data and that other workers using similar methodologies may be able to explore psychoanalytic hypotheses which eluded the current authors.

The findings also lend support to a psychosomatic formulation of the aetiology of brittle diabetes. They run counter to may current formulations of the determinants of diabetic control within behavioural medicine (Fisher et al.,1982; Surwit et al.,1982; Wing et al.,1986). The models of diabetic control put forward by these authors fall short of exploring the personal meaning underlying the symptoms of poor diabetic control and focus simply upon the pragmatic question of which methods may be most suitable for modifying behaviour. We do not wish to recommend five times weekly psychoanalysis as the treatment of choice for children with brittle diabetes but we would like to argue in favour of the consideration of dynamic factors which may underlie the condition. The present findings of a close temporal link between two specific psychological conflicts and glycosuria diabetes in the formulation of treatment strategies for such children. The case of Sally serves as an illustration of our assumption that brittle diabetes may be understood as a neurotic symptom of persons with diabetes who turn to their illness in the hope of obtaining relief from anxiety and

guilt feelings. The expression of neurotic structures in diabetic mismanagement is, we believe, an important consideration in the effective treatment of brittle diabetes.

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REFERENCES

Baker, L., Barcai, A., Kaye, R. & Haque, N. (1969). "Beta adrenergic blockade and juvenile diabetes: Acute studies and long-term therapeutic trial". *Journal of Pediatrics*, **75,** 19-29.

Barlow, D. H. & Herson, M. (1984). *Single Case Experimental Designs,* 2nd ed. New York: Pergamon.

Box, G.E.P. & Jenkins, G.M. (1976). *Time Series Analysis, Forecasting and Control,* 2nd ed. San Francisco: Holden-Day.

Edelson, M. (1986). 'Causal explanation in science and in psychoanalysis: Implications for writing a case study'. *The Psychoanalytic Study of the Child,* **41,** 89-128.

Fisher, E. B., Delameter, A. M., Bertelson, A. D. & Kirkley, B. G. (1982). 'Psychological factors in diabetes and its treatment'. *Journal of Consulting and Clinical Psychology,* **50,** 993-1003.

Fonagy, P. (1982). 'The integration of psychoanalysis and experimental science: A review'. *International Review of Psychoanalysis,* **9,** 125-145.

Gottman, J. M. (1973). 'N-of –one and n-of-two research in psychotherapy'. *Psychological Bulletin, **80,*** 93-105.

Gottman, J. M. (1981). *Time-Series Analysis; A Comprehensive Introduction for Social Scientists.* Cambridge: Cambridge University Press.

Grünbaum, A. (1984). *The Foundations of Psychoanalysis: A Philosophical Critique.* Berkeley, CA: University of California Press.

Hinkle, L. E. & Wolf, S. (1950). 'Studies in diabetes mellitus: Changes in glucose, ketone, and water metabolism during stress'. *Research in Nervous and Mental Disease,* ***29,*** 338.

Ludvigsson, J. (1977). 'Socio-psychological factors and metabolic control in juvenile diabetes'. *Acta Paediatrica Scandinavica,* ***66,*** 431-437.

Minuchin, S., Rosmon, B. & Baker, L. (1978). *Psychosomatic Families. Anorexia Nervosa in Context.* Cambridge, MA: Harvard University Press.

Moran, G. S. (1984). 'Psychoanalytic treatment of diabetic children'. *The Psychoanalytic Study of the Child,* **39,** 407-447.

Schade, D. S., Drumm, D. A., Duckworth, W. C. & Eaton, R. P. (1985). 'The aetiology of incapacitating, brittle diabetes'. *Diabetes Care,* **8,** 12-20.

Surwit, D., A. W. & Genglos, M. N. (1982). 'The role of behaviour in diabetes care'. *Diabetes Care,* **5,** 337-342.

Tattersall, R. B. (1985). 'Brittle diabetes'. *British Medical Journal,* **291,** 555-556.

Thrall, T. & Engelman, L. (1981). 'Univariate and bivariate spectral analysis'. In W. J. N. Dixon (ed.), B M D P *Statistical Software,* pp. 604-638. Berkeley, CA: University of California Press.

Wallerstein, R. S. (1985). *Forty-Two lives in Treatment: A Study of Psychoanalysis and Psychotherapy.* New York: Guilford Press.

Wallerstein, R. S. (1986). 'Psychoanalysis as a science: A response to the new challenges'. *Psychoanalytic Quarterly,* **55,** 41-451.

Wing, R. R., Epstein, L. H. Nowiak, M. P. & Lamparski, D. M. (1986). 'Behavioral self-regulation in the treatment of patients with diabetes mellitus'. *Psychological Bulletin,* **99,** 78-89.

British Journal of Medical Pychology (1987), **60,** 357-372 *Printed in Great Britain*