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Psychosocial assets and severity of chronic asthma

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A quantitative evaluation of psychosocial assets and environmental change was made in a group of 36 asthmatic patients in whom corticosteroids were part of comprehensive, long-term treatment. There were 15 men and 21 women, ranging in age from 19 to 74 years. All patients were maintained at the lowest possible dosage, but only 5 were not on steroids continuously. Psychosocial assets (coping abilities) were evaluated with the Berle Index (BI). This instrument provides quantitative values for psychologic and social items such as social status, medical history other than asthma, factors related to patient's family, interpersonal relationships, past performance, attitudes, and personality structure. The mean amount of daily prednisone or its equivalent was calculated for the year following the psychosocial testing. Patients with low psychosocial assets (BI < 80 per cent) required higher steroid dosage (mean of 15.8 mg. per day) than those with high scores (5.5 mg. per day). The rank order correlation between BI and steroid dose was significant ($r_s = -0.564$, $p < 0.001$). The Berle scores were not associated with age of onset or duration of the asthma.

Adverse environmental inputs may be directly associated with the precipitation of asthmatic attacks, influence the way the patient perceives his

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symptoms, and interfere in general with the response of the disease to medical treatment.¹⁻³ What determines the degree to which this occurs in a given patient, however, has been largely unclear. Long-term observations of chronic asthmatic patients have led to the empirical observation that certain psychosocial factors may explain, at least in part, the variable response to environmental inputs. Although methods for a comprehensive and objective evaluation of psychosocial factors have existed for many years, little use has been made of them in the study of chronic asthma.

Berle and associates⁴ in 1952, studied 736 patients with various chronic diseases. They isolated psychologic and social variables associated with the improvement or lack of improvement in these patients. Based on these items, a relatively objective instrument for assessing "psychosocial assets" was developed and called the Berle Index (BI). In 1961, Holmes and associates⁵ utilized the BI on a group of patients with pulmonary tuberculosis to predict treatment outcome. They found that treatment failure was associated with low Berle values and that the psychosocial assets remained relatively constant over a period of time. Dudley and co-workers⁶ observed that the probability of early death in a group of patients with diffuse obstructive pulmonary disease was increased in the presence of low psychosocial assets.

In this report, the association between psychosocial assets and severity of chronic asthma was examined. This was done by: (1) utilizing the method developed by Berle for quantification of factors involving psychologic and social variables; and (2) correlating the numeric values of these variables to the severity of chronic asthma, as indicated by the mean daily dose of adrenocorticosteroids required to control it. If the same relationship holds with asthma as with other chronic diseases, a patient with low psychosocial assets would tend to pursue a more severe course and, consequently, require a higher dose of medication to control his disease.

METHOD

The instrument utilized in this study—the Berle Index—is divided into three parts (Table I): Part 1 deals with data such as age, social status, and past medical history and is allotted 20 points. Part 2 relates to items associated with the patient's family and interpersonal relationships as they are perceived by the patient (30 points). Part 3 consists of the physician's evaluation of the patient's past performance, personality structure, and attitudes toward his illness (based on historical data) and is allotted 40 points. The numbers obtained by adding the scores are converted to a percentage of the maximum possible score.

The subjects in this study were 36 chronic asthmatic patients for whom corticosteroids were part of comprehensive, long-term treatment. They were selected not only for the chronicity of their symptoms but also for their reliability in keeping appointments and following medical advice. Possibly for this reason, all 36 completed the study. There were 15 men and 21 women, ranging from 19 to 74 years of age. All patients were maintained at the lowest possible steroid dose; 5 did not require continuous steroid treatment. None had significant symptoms related to extrinsic allergic factors.

The psychosocial evaluation was done in 3 or 4 visits to the Allergy Clinic of the University of Washington Hospital. It was performed by an investigator who was not involved in the medical management of the patients and was not aware of the steroid dosage. It should be emphasized that the presence or absence of an underlying psychiatric disorder was not a factor in the selection of the patients.

TABLE 1. Psychosocial items evaluated for the Berle Index with the maximum possible score given for each item

Berle Index	Points allotted
Part 1	
Age, up to 40 years	2
Not divorced or separated	2
Third generation American, white, gentile	2
High school education complete	2
Both parents living at home until patients was 12 years old	4
No surgical treatment for symptoms	2
No previous formal psychiatric care	2
Steady employment	2
Duration of present illness less than 5 years	2
Total	20
Part 2	
Previous health good	1
Some religious education	1
Emotional support from both parents	4
Congenial siblings	2
Emotional support from spouse	2
Sexual compatibility with spouse	2
No serious sexual problem	3
Spouse adequate economic provider*	2
Children not rejected	2
No housing problem	2
Occupational satisfaction	2
Congenial working conditions	2
Moderately adequate salary	2
Goal	3
Total	30
	Females
	Males
	28
Part 3	
Evidence from past performance	
Not exaggerated sensitivity to traumatic situation	
Good interpersonal relationships (including sexual)	10
Evidence that the activities, achievements, and other life experience have afforded satisfaction	
Evidence from personality structure	
Moderate flexibility	
Minimal and short-lived hostility	
Capacity to face and solve personal problems	
Active participation in the give and take of daily affairs	10
Moderate orderliness and reliability	
Good judgment and evidence of adequate discrimination regarding human values and goals	
Prevailing attitudes of the patient toward illness and his problems at time of admission to clinic	
Recognition of failure of present patterns of adjustment and willingness to adopt others	
Willingness to consider possibility that life stress, attitudes, and feeling states are relevant to the illness	10
Confidence in physician, hospital, and its methods	
Capacity and willingness to assume responsibility in treatment	
Extent to which a specific aspect of the life situation was a factor in precipitating the patient's illness	
Extent to which this specific feature is modifiable with regard to the involved person, other persons, and circumstances	10
Total	40

*Scored only for female patients.

TABLE II. Duration of asthma and mean daily prednisone dose of patients with Berle scores below 80 per cent

Patient	Sex	Age	Asthma duration (yr.)	Steroid dose (mg.)	Berle scores			Total score (% of maximum)
					Part 1	Part 2	Part 3	
N. D.	F	59	11	7.7	8	23	29	67
R. B.	M	37	11	0.0	18	25	24	76
H. R.	F	33	28	23.5	18	25	22	72
G. S.	M	43	2	11.5	12	20	34	75
G. I.	F	64	55	7.5	12	25	21	64
D. B.	F	32	4	0.0	14	17	27	64
N. B.	F	41	39	18.0	8	17	28	59
N. C.	F	40	6	21.0	6	21	31	64
I. J.	F	42	14	30.0	9	24	35	76
C. M.	F	56	10	25.0	8	15	17	44
D. N.	M	63	10	13.5	10	22	29	69
R. O.	M	62	2	15.0	15	23	29	76
J. P.	M	21	2	25.0	9	11	19	43
E. J.	F	43	39	24.0	10	20	28	64
Mean		45.4	16.6	15.8	11.2	20.6	26.6	65.2

TABLE III. Duration of asthma and mean daily prednisone dose of patients with Berle scores of 80 per cent or above

Patient	Sex	Age	Asthma duration (yr.)	Steroid dose (mg.)	Berle scores			Total score (% of maximum)
					Part 1	Part 2	Part 3	
O. C.	M	49	25	0.3	14	28	35	88
J. F.	M	37	33	0.0	18	26	36	90
D. J.	F	44	22	8.0	12	26	35	81
N. M.	F	41	14	5.0	16	30	38	93
D. M.	M	74	31	8.8	16	28	40	96
M. P.	F	66	26	8.2	14	27	31	80
A. P.	F	30	18	2.5	14	30	36	89
J. W.	F	59	5	9.0	15	30	36	90
J. C.	M	50	9	10.2	15	28	35	89
S. A.	M	21	15	1.5	18	22	36	86
D. A.	F	27	10	1.0	16	22	34	80
M. B.	F	19	9	8.3	13	24	35	80
L. C.	F	41	14	10.0	17	29	35	90
J. H.	F	32	5	7.0	18	27	36	90
A. M.	M	48	10	10.0	14	28	35	88
R. O.	M	32	31	6.5	16	25	31	82
E. P.	F	39	9	0.0	14	28	38	89
S. N.	F	27	21	7.0	16	26	34	84
R. R.	M	59	5	5.3	16	23	35	84
F. T.	M	28	1	0.0	20	28	25	83
J. S.	M	21	15	5.0	15	22	38	85
S. S.	F	18	12	6.4	16	27	33	84
Mean		39.2	15.5	5.5	15.6	26.6	34.9	86.4

When the psychosocial evaluation was completed, the patients were arbitrarily divided into two groups according to their Berle scores—low psychosocial assets for patients with Berle scores below 80 per cent and high psychosocial assets for patients with scores above 80 per cent. One year later their medical records were reviewed, and the mean daily amount of prednisone (or its equivalent) used that year was calculated. The medical management, including adjustment of the steroid dose, was done by physicians unaware of the Berle

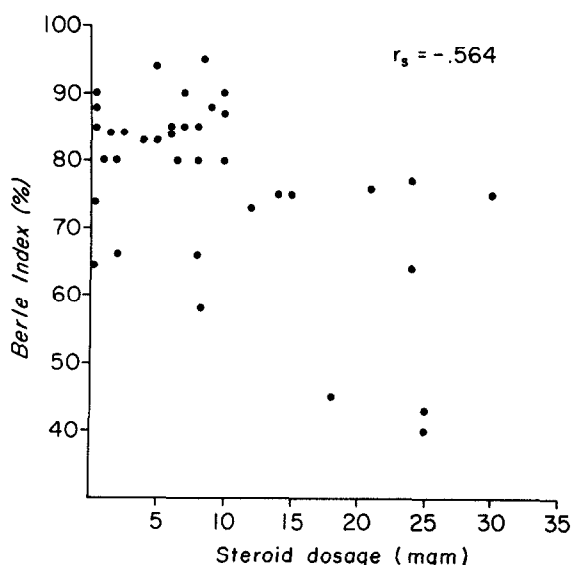


FIG. 1. Each point indicates the Berle score and the mean daily steroid dose (as prednisone) for one patient. Note that none of the patients with high scores required more than 10 mg. per day for adequate asthma control during the period of the study.

ratings. It should be noted that the mean steroid dose did not change significantly in any patient during the year of study.

RESULTS

The data obtained for the patients with Berle scores below 80 per cent is summarized in Table II. Table III gives the data for the patients with high Berle scores. As a group, patients with low Berle scores required a higher prednisone dose (mean of 15.8 mg. per day) than did those with high scores (5.5 mg. per day). By the Wilcoxon rank sum test, this was a significant difference ($p < 0.005$, one-sided). Considering all the patients of both groups, there was a negative rank order correlation between psychosocial assets and steroid dosage (Fig. 1). The correlation coefficient, $r_s = -0.564$, was highly significant ($p < 0.001$). The scores of each of the 3 parts of the BI were also correlated separately with the steroid dose by rank order. Part 1 was not significant; Part 2 was significant ($p < 0.005$); Part 3, as a whole, was significant, with a negative correlation coefficient, $r_s = -0.471$ ($p < 0.005$). The sections of Part 3 evaluating past performance, attitudes toward illness, and modifiability of factors involved were not significant. The section evaluating personality structure was highly significant ($r_s = -0.651$, $p < 0.0005$).

The scores did not seem to be influenced by early onset of asthma. Ten patients had the first onset of asthma at an early age; 7 of those had high Berle scores. A t test comparing age of onset in the high and low Berle groups was not significant ($t = 0.815$). Also, low Berle scores did not appear to be a function of the duration of asthma in years. Twenty-one patients had asthma for more than 10 years, and 14 of those had high Berle scores. The t test com-

paring duration of asthma in the high and low Berle groups was not significant ($t = 0.241$).

DISCUSSION

The association we observed between the index of psychosocial assets and the response to therapy of chronic asthma, measured by the single variable of corticosteroid dose, is similar to that observed in other chronic diseases. Thus, this study gives further support to the hypothesis that the development of certain enduring methods of living by the patient results in varying abilities to adjust to life situations and has a significant influence on the clinical course of subsequently developed disease processes.

From the previous work done with the Berle Index, it appears to measure traits which do not change significantly with time.⁵ Nor does it seem to be influenced adversely by the development of a chronic disease such as asthma. If this were the case, one might expect a negative correlation between the Berle scores and duration of asthma. From our data, there was no significant difference. Nor was there such a correlation with age of onset; indeed the trend, not statistically significant, was in the opposite direction.

It is impossible to rule out completely other explanations for the differences seen. It is unlikely, however, that they could be explained by differences in thoroughness of medical management and patient cooperation; the patients were all managed in one clinic by the same physicians and were selected for the study in part for their reliability. More difficult to rule out are the effects of differences in living conditions influenced by factors measured by the Berle Index. We have no positive evidence that these effects could be significant; making an association between asthma and nonspecific environmental factors is notoriously difficult, unless the factors are of epidemic proportions.⁷

Patients with low psychosocial assets (low adaptive ability) and chronic disease exhibit few options for coping with environmental change. As a result they often need to resort to relatively primitive psychological defenses (such as denial, repression, and isolation) to protect themselves from potentially harmful stimuli. Patients with high psychosocial assets (high coping ability) exhibit many different coping behaviors. They appear to be able to utilize their resources in an appropriate way to maintain or re-establish psychophysiologic equilibrium, and this may be the reason why their responses to medical support are relatively good.⁶

The Berle Index, though primarily a research tool, might be useful as a supplemental guide to aid in evaluating and counselling patients who may be difficult to manage and thereby require additional clinical time.

This study now is directed toward factors relevant to the future of an asthmatic patient that can be elicited by evaluating psychosocial assets as reflected in the Berle Index. This type of evaluation provides the clinician with a quantitative score which reflects the patient's potential for handling environmental change.

In addition, recent environmental changes are now being quantified and associated with variations in the severity of asthma. Preliminary data utilizing

the Schedule of Recent Experience,^{8,9} which measures environmental changes quantitatively, indicates that patients with high psychosocial assets have only mild fluctuations in severity of asthma, even when there is a high degree of life change. On the other hand, those with low psychosocial assets undergo significant exacerbations of disease when minimal life changes occur.¹⁰ If these impressions are substantiated, it would seem reasonable to advise these patients to modify their life styles to avoid social change if stabilization of asthma is the primary clinical goal.

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