PRACTICE OBSERVED

Simple scale for assessing level of dependency of patients in general practice

JAMES WILLIS

Abstract

A rating scale has been designed for assessing the degree of dependency of patients in general practice. An analysis of the elderly and disabled patients in a two doctor practice is given as an example of its use and simplicity.

Introduction

Many scales for the assessment of disability and social functioning have been described. Powell Lawton and Brody commented on the many existing incompatible scales, while describing two new scales of their own. Scales have been designed for use during the rehabilitation of patients in hospital, for social service departments and local authorities in the evaluation of their facilities for the elderly, for community medicine departments in the measurement of dependency in the community, and several have been designed specifically for use in primary care and general practice. Of the last group, the King's Fund Functional Rating Chart for the Elderly and the Geriatric Patient Assessment Record adopted by Sandoz Pharmaceuticals, were produced in a form intended for widespread use in general practice. The King's Fund scale was the basis of the new scale described here, which was designed for use in a computerised dependent patient review index for general practice.

The scale

The scale (table) consists of a series of dependency attributes which are grouped under nine headings: Category, Social, Accommodation, Housing conditions, Mobility, Mental state, Senses, Continence, and General ability to cope. From each group the user chooses the attribute which most accurately describes the patient's circumstances. The wording of each attribute was chosen to be self explanatory and complete in itself while fitting into one 40 character line of a computer screen. The scale is intended for use without additional explanatory notes.

As far as possible the descriptions are absolutes, but the choices under "Housing conditions," "Continence," and "General ability to cope" are dependent on judgments by the user. The last heading is deliberately

Alton Health Centre, Alton, Hants GU34 2QX
JAMES WILLIS, MB, MRCGP, general practitioner

The assessment scale showing the dependency scores for each attribute and an analysis of the 259 patients currently included in the dependent patient review index

	Score*	No	%
Category			
1 Under 75 chronic sick	+5	25	
2 Major current problem	+10	5	
3 Elderly 75+		223	
4 Not yet assessed		6	
Social			
1 Living alone	+10	99	39
2 Living with fit spouse		72	28
3 Living with unfit spouse	+5	23	9
4 Living with companions		59	23
Accommodation			
1 Own home—good social contacts		145	57
2 Own home—isolated	+5	32	12
3 In relations' house		24	9
4 Living in lodgings	+2	5	1
5 In sheltered accommodation		40	15
6 In old people's home or hospital		9	3
Housing conditions			
1 Good housing conditions		215	84
2 Housing unsatisfactory	+5	31	12
3 Squalid housing conditions	+10	7	2
Mobility			
1 Normal activity inside and out		146	57
2 Movements restricted—out alone	+3	68	26
3 Movements restricted—out with help	+5	13	5
4 Housebound	+9	21	8
5 Chairbound—needs help to toilet	+12	5	1
6 Bedfast	+15	0	0
Mental state			
1 Cheerful mental state		191	75
2 Depressed or pleasantly confused	+5	49	19
3 Confused and difficult	+10	12	4
4 Dangerous mental state	+15	1	1
Senses			
1 Good vision and hearing		179	70
2 Partially sighted	+3	14	5
3 Difficulty hearing conversation	+2	53	20
4 Deafness and visual handicap	+5	5	1
5 Completely blind	+10	2	<1
Continence			
1 No continence problems		230	90
2 Some continence problems	+5	17	6
3 Severe continence problems	+15	6	2
General ability to cope			
1 Happy, stable situation		121	47
2 Coping reasonably	+3	111	43
3 Considerable difficulty coping	+7	19	7
4 Grossly unsatisfactory situation	+15	2	<1

*Scores are added to obtain each patient's total dependency score.

intended to be a catch-all to reflect the doctor's general assessment of the patient. Details of the patient's medical condition are excluded, the scale concentrates on social functioning.

The patient's assessment is given to the computer in the form of a nine digit code—one number for each group of attributes. Because the information is stored in this form it can be analysed and retrieved from the index in seconds.

Dependency score

The various dependency factors obviously mean greater or lesser degrees of difficulty for the patient concerned. I have attempted to reflect the degree of adversity of the different attributes by attaching what seem to be appropriate weighting scores. Thus "cheerful mental state" rates 0, whereas "dangerous mental state" scores 15. These scores are unavoidably subjective, they have the same mathematical validity as a set of figures designed to measure the beauty of a sunset. The computer program, however, uses them to calculate a dependency score for each patient which, because it is a simple number and not a complex rating code, produces a relatively objective ranking of the patients in order of dependency. Furthermore, the total practice dependency score and the average are novel indices of practice workload.

The table gives an analysis of those patients in our practice who were included in the dependent patient review index on the date of printing. A report like this is produced by the program whenever the user wishes. It gives the full rating scale and a reminder of the weighting scores attached to each attribute. It also gives the number of patients in each group at the time of printing and the percentage that each represents of the total.

Discussion

Despite the many functional rating scales that have been described, none has come into widespread use in general practice. This may be because they are complex, and any benefits resulting from their use have not justified the effort in applying them. In some respects this scale is simple compared with others but its simplicity makes it easy to use routinely and may more than compensate for its lack of objectivity. (See paper next week.)

The entire scale, including all the explanation it requires, can be printed on one side of a standard 7 in × 4½ in National Health Service record card. When a scale such as this is used with a computer system it becomes more than a means of measuring relative dependency, it also provides an index of social morbidity for the practice.

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References

1 Powell Lawton M, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist* 1969;9:179-86.
2 Gordon Parish J, James DW. A method of evaluating the level of independence during the rehabilitation of the disabled. *Rheumatol Rehabil* 1982;21:107-14.
3 Mahoney FI, Barthel DW. Functional evaluation: the Barthel index. *Maryland State Med J* 1965;14:61-5.
4 Schepherst B. Development of a functional rating chart for the elderly. *Social Work Service* 1979;19 March:3-6.
5 Booth T, Barritt A, Berry S, Martin DN, Melotte C, Stone S. Levels of dependency in local authority homes for the elderly. *J Epidemiol Community Health* 1982;36:53-7.
6 Booth T. Measuring dependency. *Community Care* 1980;Jan 31:15-8.
7 *Assessing care requirements of elderly people.* Health Operational Research Unit, 229 King's Road, Reading RG1 4LS. (Broadsheet No 8.)
8 Staff of the Benjamin Rose Hospital. A new classification of functional status in activities of daily living. *J Chronic Dis* 1959;9:55-62.
9 Katz S, Ford AB, Moskowitz RW, *et al.* The index of ADL: a standardised measure of biological and psychosocial function. *JAMA* 1963;185:914-9.
10 Katz S, Downs TD, Cash HR, Grotz RC. Progress in development of the index of ADL. *Gerontologist* 1970;10:20-30.
11 Fillenbaum GG, Smyer MA. The development, validity and reliability of the OARS multidimensional functional assessment questionnaire. *J Gerontol* 1981;36:428-34.
12 The "Elderly at Risk" register. London: King's Fund Centre. (KFC 80/198.)
13 Parkerson GR, Gehlbach SH, Wagner EH, *et al.* The Duke-UNC health profile: an adult health status instrument for primary care. *Med Care* 1981;19:806-28.
14 Geriatric Patient Assessment Records. Sandoz Pharmaceuticals. Rating scale adapted from the "Crighton Royal Behaviour Rating Scale." (Robinson RA. *Gerontologica Clinica* 1961;3:247.)
15 Martin JL, Doyle VG. Survey of the elderly in an urban general practice. *Ir Med J* 1984;77:359-62.
16 Smith AM, Robertson R. An assessment of the elderly patients in a new town general practice using "Glasgow Woodside geriatric assessment form." *Health Bull (Edinb)* 1984;42:234-41.

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Contribution of Gardnerella vaginalis to vaginitis in a general practice

T C O'DOWD, R R WEST, C D RIBEIRO, J E SMAIL, J A MUNRO

Abstract

In a study of 154 adult women who presented to their general practitioner with vaginal symptoms 30 (20%) had *Gardnerella vaginalis* on its own and 51 (33%) had *G vaginalis* in combination with anaerobes or known pathogens. Thirty one (20%) patients were culture negative. Those who were culture negative had fewer symptoms and signs of vaginitis than those with *G vaginalis* alone or *G vaginalis* plus anaerobes. Those with known pathogens had more symptoms and signs than those with *G vaginalis* alone or *G vaginalis* plus anaerobes. Those with known pathogens plus *G vaginalis* had the most severe signs and symptoms of vaginitis. It is concluded that *G vaginalis* can cause vaginitis on its own, and it makes vaginitis worse when present with other organisms. *G vaginalis* was also found in 30 (21%) of the 138 control patients who, although they presented "asymptomatically," had worse signs than control patients without *G vaginalis*. It seems that *G vaginalis* can occur in a spectrum ranging from the uncomplaining patient to those with severe vaginitis.

University of Wales College of Medicine, Cardiff
T C O'DOWD, MD, MRCGP, lecturer, department of general practice
R R WEST, PHD, FSS, senior lecturer, department of epidemiology and community medicine
J E SMAIL, SRN, SCM, research sister, department of general practice

Public Health Laboratory Service, University Hospital of Wales, Heath Park, Cardiff
C D RIBEIRO, MB, MRCPATH, consultant medical microbiologist
J A MUNRO, MB, BS, senior medical microbiologist

Correspondence to: Dr T C O'Dowd, Health Centre, Llanedeyrn, Cardiff CF3 7PN.

Introduction

Since 1955 when Gardner and Dukes reported *Haemophilus vaginalis* (now called *Gardnerella vaginalis*) as a cause of non-specific vaginitis it has been isolated mainly from genitourinary, student, and family planning clinics, with wide variations in the prevalence of the organism in patients attending these clinics. There is a

continuing controversy about its importance as a pathogen and its ability to cause vaginitis. There have been no reports of its prevalence in a general practice population.

The aims of this study were (i) to identify the prevalence of *Gardnerella vaginalis* among women who presented with vaginal symptoms in general practice; (ii) to identify the prevalence of the organism among asymptomatic women controls; (iii) to test the hypotheses that (a) *G vaginalis* on its own is a vaginal pathogen and (b) if present with other known pathogens (yeasts, *Trichomonas*, anaerobes, *Escherichia coli*, *Chlamydia*, herpes) makes vaginal symptoms worse.

Method

The study was carried out in the department of general practice, which serves a population mainly belonging to social classes III to V according to the Registrar General's classification. There were 2609 women over 16 years of age registered with the practice in 1983. Women who were not pregnant who presented to their doctor with a history of vaginal discharge, soreness, or irritation (hereafter called vaginal symptoms) during the 12 months from January to December 1983 were included in the study. Patients were requested by their doctor to see the research sister (JES) who asked a set of standard questions about the duration and severity of symptoms and about the use of contraceptives and antibiotics. She then carried out a vaginal examination and recorded the amount, colour, and type of discharge, and the degree of soreness on vaginal examination, measured the vaginal pH using Duotest strips (Macherey-Nagel), and performed the amine test.

High vaginal or cervical swabs were taken and cultured for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, herpesvirus sp, yeasts, *G vaginalis*, and anaerobes. Wet mount preparations were prepared for immediate microscopic diagnosis of *Trichomonas*, *Candida*, and "clue cells" by the practice laboratory technician. The chlamydial swab from the cervix was placed in chlamydial transport medium and refrigerated at 4°C until ready for inoculation into McCoy cells at the laboratory. A cervical swab (and a swab from lesions if present) was obtained, placed in virus transport medium, and stored at 4°C for herpes identification. Gonococcal swabs were plated immediately on to Thayer-Martin medium and incubated at 37°C in 7% CO_2. The *G vaginalis* and anaerobes swab was placed in Stuart's medium and stored at 4°C until cultured by the laboratory. All specimens were transported to the Public Health Laboratory Service daily.

Culture and identification of pathogens were performed by standard techniques. *G vaginalis* was defined by (i) Gram-variable coccusbacillus; (ii) producing tiny colonies after 48 hours' incubation; (iii) causing haemolysis on human blood agar; (iv) hydrolysing hippurate; and (v) being resistant to sulphonamide and 5 µg metronidazole discs but sensitive to 50 µg metronidazole discs (with one discrepant result from (iii) to (v) allowed).

Asymptomatic women from the same general practice who presented during the study to the sister for cervical smears or family planning checks were recruited as controls. A simple high vaginal swab was taken, and the presence or absence of vaginal discharge and vaginitis was noted. The swab was placed in Stuart's medium at 4°C and transferred to the laboratory for culture of *G vaginalis* and yeasts (microscopic examination was performed for *Trichomonas*).

Statistical comparisons were made by χ^2 throughout.

Results

During the 12 month study period 210 women presented with vaginal symptoms, and 154 were included in the study. 56 were excluded because (i) eight had a proved urinary infection to account for their symptoms; (ii) some presented on Friday afternoons when early transfer of specimens to the laboratory was not possible; (iii) the doctor either forgot to refer or considered that patients needed immediate treatment; or (iv) the research sister was on holiday. Retrospective analysis of the medical records of excluded patients showed that they did not differ noticeably from study patients in respect of age and severity or character of symptoms.

Table I lists the organisms that were isolated from patients. *G vaginalis* was isolated in 81 (53%) patients: alone in 30 (20%), with anaerobes in 26 (17%), and with other organisms in 25 (16%). Other micro-organisms (yeasts, *Trichomonas*, anaerobes, *E coli*, *Chlamydia*, herpes) were recovered from 42 (27%) patients, and these are henceforth referred to as known pathogens. *Neisseria gonorrhoeae* was not isolated. Thirty one (20%) patients grew no vaginal pathogens and are henceforth referred to as culture negative patients. Table I also lists the organisms recovered from 138 asymptomatic control patients.

Figure 1 shows the relations between the three common presenting

symptoms (soreness, irritation, and discharge) and results of the laboratory isolations. Patients who were culture negative reported the fewest symptoms, and those with *G vaginalis* alone or *G vaginalis* plus anaerobes reported more. Vaginitis patients with known pathogens reported more symptoms again (seven patients with anaerobes only were included in this group because separate analysis showed that they had a similar pattern of symptoms) and those with *G vaginalis* plus known pathogens reported the most. This gradation of symptom frequency in patients from culture negative to *G vaginalis* plus known pathogens was highly significant: analysed as a 3×5 table (one, two, or three symptoms v negative, *G vaginalis*, known pathogens, anaerobes plus *G vaginalis*, and known pathogens plus *G vaginalis*), $\chi^2=38$, $p<0.001$.

TABLE I—*Organisms isolated from 154 patients with vaginitis and 138 asymptomatic control patients who presented to the doctor*

	No (%) of patients	No (%) of control patients
Gardnerella vaginalis alone	30 (20)	24 (17)
G vaginalis + anaerobes	26 (17)	6 (4)
G vaginalis + known pathogens		
Yeasts	14 (9)	
Trichomonas	7 (5)	
Herpes	3 (2)	
Chlamydia	1 (1)	
Known pathogens		
Yeasts	30 (19)	3 (2)
Trichomonas	2 (1)	
Anaerobes	7 (5)	
Escherichia coli	3 (2)	
Gonococcus		
Culture negative	31 (20)	105 (76)
Total	154 (100)	138 (99)

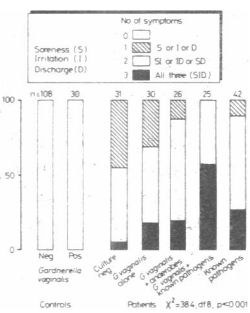
No of symptoms
Soreness (S)
Irritation (I)
Discharge (D)
0
1 S or I or D
2 SI or ID or SD
3 All three (SID)
n=108
30
31
30
26
25
42
100
% 50
0
Neg
Pos
Gardnerella vaginalis
Culture neg
G vaginalis alone
G vaginalis + anaerobes
G vaginalis + known pathogens
Known pathogens
Controls
Patients $\chi^2=38.4$, df 8, p<0.001

FIG 1—Numbers of vaginal symptoms in 154 patients and 138 control patients who presented to the general practitioner.

TABLE II—*Soreness on vaginal examination in 154 patients presenting to the general practitioner with vaginal symptoms (percentages in parentheses)*

Soreness on examination	Culture negative	*G vaginalis* alone	*G vaginalis* + anaerobes	*G vaginalis* + known pathogens	Known pathogens
No (includes slight)	27 (87)	23 (77)	16 (62)	6 (24)	23 (55)
Yes	4 (13)	7 (23)	10 (38)	19 (76)	19 (45)

$\chi^2=27.2$, $p<0.001$

Table II compares soreness on vaginal examination with laboratory findings. The culture negative group had the least degree of soreness; those with *G vaginalis* alone had less soreness than those with anaerobes plus *G vaginalis*. Patients with *G vaginalis* and known pathogens had significantly more soreness than those with known pathogens alone or those with *G vaginalis* alone.

Table III compares discomfort related to intercourse with laboratory findings. It follows a similar pattern to soreness on vaginal examination with the culture negative group having the least discomfort and those with *G vaginalis* plus anaerobes having more discomfort than those with *G vaginalis* alone. Those with *G vaginalis* plus known pathogens had significantly more discomfort than those with known pathogens alone.

Figure 2 shows the amount of discharge for the control patients and patients. Even among the control patients some who were *G vaginalis* positive showed a discharge. Few culture negative patients showed a discharge, whereas over half of those with *G vaginalis* alone produced a discharge, and over three quarters of those with *G vaginalis* plus anaerobes produced a discharge. Similarly, more women with *G vaginalis* plus known pathogens produced a discharge than women with known pathogens only.

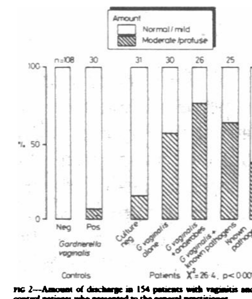

FIG 2—Amount of discharge in 154 patients with vaginitis and 138 control patients who presented to the general practitioner.

TABLE III—*Discomfort related to intercourse among 142 sexually active patients presenting to their general practitioner with vaginal symptoms (percentages in parentheses)*

Discomfort on intercourse	Culture negative	*G vaginalis* alone	*G vaginalis* + anaerobes	*G vaginalis* + known pathogens	Known pathogens
No (includes sometimes)	25 (93)	20 (71)	16 (64)	8 (32)	20 (54)
Yes (appreciable)	2 (7)	8 (29)	9 (36)	17 (68)	17 (46)

$\chi^2=22.5$; $p<0.001$.

Discussion

The prevalence of *G vaginalis* in this study in both patients and control patients was unusually high. The organism has not been studied in general practice populations and has been reported only from selected populations. The numbers of negative cultures from our study were much lower than the 43% reported in a recent study in general practice by Hiscock; however, the larger number of apparently negative results in that study might be explained by the fact that *G vaginalis* was not looked for.

Much interobserver variability has been shown between two clinicians recording the amount of discharge, although Taylor *et al* found a good correlation between doctor and patient on amount of

discharge. In our study, with a single observer, *G vaginalis* alone or with other organisms was a powerful producer of discharge. The pattern of discharge observed (fig 2) is different from the patterns of symptoms reported (fig 1) or observed signs (tables II and III): *G vaginalis* plus anaerobes produced the most discharge but *G vaginalis* plus known pathogens caused the most symptoms and signs of vaginitis. This mismatch between the amount of discharge observed and symptoms and signs has led to the depreciatory term "vaginosis" (discharge without vaginitis). As the discharge smells vile, many sufferers are more troubled by the discharge than by the vaginitis, whereas the converse may apply to the attending clinician.

It is difficult to decide on appearance whether a vaginal mucosa is inflamed or not. We relied on a single observer throughout our study, and the report of discomfort related to intercourse and of tenderness on vaginal examination are objective evidence of vaginal inflammation. Furthermore, the symptom (discomfort on intercourse, table II) and the sign (tenderness on vaginal examination, table II) both follow a similar pattern to the presenting symptoms of soreness, irritation, and discharge and thereby provide internal validation.

It is generally accepted that *G vaginalis* plus anaerobes cause a vaginitis; yet in our study the pattern of presenting symptoms in the group with *G vaginalis* alone was similar to that in the group with *G vaginalis* plus anaerobes. When the two groups, known pathogens and known pathogens plus *G vaginalis*, are compared the frequency and severity of reported symptoms is significantly greater in the latter group. These findings are at variance with the notion that G vaginalis on its own causes a vaginosis (discharge but no vaginitis) and support our hypotheses that *G vaginalis* on its own may cause a vaginitis and when present with known pathogens contributes to the degree of vaginitis.

Twenty two per cent of control patients grew *G vaginalis* and, though asymptomatic, about half exhibited some tenderness on examination or had increased vaginal discharge. There is also wide variability in the amount of discharge and discomfort women will tolerate before presenting to their doctor, and perhaps some signs (subconsciously) prompted these women to attend for cervical smears or family planning checks.

There is a spectrum of vaginal symptoms and signs ranging from clinically mild to severe. It seems that *G vaginalis* may be present at any point within that spectrum (either alone or in combination with other pathogens), but at whatever point it occurs in that spectrum it adds to the symptoms. If *G vaginalis* contributes as much to vaginitis in patients in other practices as it does in ours then doctors will have to broaden their diagnosis and management in dealing with this common condition. Our findings suggest that it is not enough to assume that vaginal symptoms fall into the broad categories of "another attack of thrush" or "non-specific vaginitis."

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References

1 Gardner HL, Dukes CD. *Haemophilus vaginalis* vaginitis. A newly defined specific infection previously classified "non-specific vaginitis." *Am J Obstet Gynecol* 1955;69:962-76.
2 Taylor E, Blackwell AL, Barlow D, Phillips I. Gardnerella vaginalis, anaerobes and vaginal discharge. *Lancet* 1982;i:1376-9.
3 Tobaqchali S, Willis M, Thin RN. Gardnerella vaginalis and anaerobic bacteria in genital disease. *British Journal of Venereal Diseases* 1983;59:111-5.
4 Spiegel CA, Amsel R, Eschenbach D, Schoenknecht M, Holmes KK. Anaerobic bacteria in non-specific vaginitis. *N Engl J Med* 1980;303:601-7.
5 Bramley HM, Dixon RA, Jones BM. Haemophilus vaginalis (Corynebacterium vaginale, Gardnerella vaginalis) in a family planning population. *British Journal of Venereal Diseases* 1981;57:62-6.
6 McCormack WM, Hayes CM, Rosner B. Vaginal colonisation with Corynebacterium vaginale (*Haemophilus vaginalis*). *J Infect Dis* 1977;136:740-5.
7 Levison ME, Trestman I, Quach R, Sladowski C, Floro CN. Quantitative bacteriology of the vaginal flora in vaginitis. *Am J Obstet Gynecol* 1979;133:139-44.
8 Hiscock E. Sexually transmitted diseases in a general practice. *J R Coll Gen Pract* 1982;32:627-31.
9 Sandey VC, Jones JB, Harley R, Foulkes JEB, deLouvois J. Morbidity of the lower genital tract during pregnancy. *J Clin Pathol* 1975;28:736-40.
10 Blackwell AL, Fox AR, Phillips I, Barlow D. Anaerobic vaginosis (non-specific vaginitis): clinical, microbiological and therapeutic findings. *Lancet* 1983;ii:1379-82.

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