Long-term prognosis of depression in primary care

G.E. Simon

This article uses longitudinal data from a primary care sample to examine long-term prognosis of depression. A sample of 225 patients initiating antidepressant treatment in primary care completed assessments of clinical outcome (Hamilton Depression Rating Scale and the mood module of the Structured Clinical Interview for DSM-IIIR) 1, 3, 6, 9, 12, 18 and 24 months after initiating treatment. The proportion of patients continuing to meet criteria for major depression fell rapidly to approximately 10% and remained at approximately that level throughout follow-up. The proportion meeting criteria for remission (Hamilton Depression score of 7 or less) rose gradually to approximately 45%. Long-term prognosis (i.e. probability of remission at 6 months and beyond) was strongly related to remission status at 3 months (odds ratio 3.65; 95% confidence interval, 2.81–4.76) and only modestly related to various clinical characteristics assessed at baseline (e.g. prior history of recurrent depression, medical comorbidity, comorbid anxiety symptoms). The findings indicate that potentially modifiable risk factors influence the long-term prognosis of depression. This suggests that more systematic and effective depression treatment programmes might have an important effect on long-term course and reduce the overall burden of chronic and recurrent depression.

Keywords: United States of America; depressive disorder, diagnosis; depressive disorder, epidemiology; disease progression; chronic disease, epidemiology; risk factors; longitudinal studies.

Introduction

Depression is increasingly recognized as a chronic or recurrent illness. A number of long-term follow-up studies of psychiatric outpatients yield generally similar findings (1–4). Of depressed patients treated by specialists, up to 50% do not recover by 6 months and 10% show a chronic course (i.e. do not recover from the index episode over 5 years or more). Among those who recover, risk of relapse is 40% or more over 2 years and exceeds 80% over 15 years. While less information is available regarding the long-term prognosis of depression in primary care or community samples, available data from these populations also suggest significant risk of recurrent illness. In a sample of patients initiating antidepressant treatment in primary care, Lin et al. (5) reported that only 10% met criteria for major depression after 7 months, but 37% experienced a major depressive relapse during the next year. Coryell et al. (6) reported a 34% risk of relapse over a 6-year period in a non-clinical sample.

Reports to date cite a variety of factors associated with higher risk of persistent or recurrent depression. These include factors related to prior clinical history (e.g. prior history of recurrent depression (2, 4), history of dysthymia (1, 3, 4)), medical and psychiatric comorbidity (e.g. comorbid anxiety disorder (7–9), chronic medical illness), and characteristics of the index depressive episode (e.g. severity of depressive symptoms at baseline (1, 3), incomplete recovery following acute treatment (10)). The most detailed data regarding predictors of long-term prognosis of depression are drawn from specialist clinic samples. Available data from non-clinical (6, 11) and primary care samples (5, 12, 13), however, support a similar list of risk factors (initial severity, incomplete recovery, comorbid anxiety disorder, prior history of recurrent depression).

The most important question regarding the long-term prognosis of depression is whether risk of chronic or recurrent illness is modifiable. Many of the frequently cited predictors of long-term outcome (e.g. age at onset, number of prior depressive episodes, comorbid anxiety disorder) are stable characteristics, which probably reflect overall severity of depressive illness or long-term vulnerability to depressive disorder. This long-term vulnerability to depression could result from any combination of genetic predisposition and life experience. In any case, these long-term risk factors are not modifiable by short-term intervention. In contrast, incomplete resolution of the index depressive episode (one of the most consistently cited predictors of poor long-term prognosis) is at least potentially modifiable during acute treatment.

This report uses data from a large primary care sample to examine the long-term prognosis of depression. Data were originally collected as part of a randomized trial examining the cost-effectiveness of newer and older antidepressants. Follow-up data
over 24 months were used to examine: how outcome of depression in primary care varies across individuals and over time; the concordance between clinical and functional outcomes; and how various risk factors (modifiable and non-modifiable) are associated with long-term prognosis.

**Methods**

Study methods are described in detail in earlier publications (14–16) and will be summarized here. Patients were enrolled from selected primary care clinics of the Group Health Cooperative (GHC), Puget Sound, WA, USA, an integrated health care system providing all outpatient and inpatient health services to a defined population of members (approximately 400 000 members in this case). The study protocol was approved by the GHC Human Subjects Review Committee. At participating clinics, all primary care physicians were asked to refer any adult patient beginning antidepressant treatment for depression if physician and patient were prepared to accept random assignment of the initial medication. The need for antidepressant treatment was based strictly on the judgement of the referring physician, regardless of medical comorbidity or severity of depression. Study personnel were immediately available (on site or by telephone) to screen referrals, obtain written informed consent, and assess the following exclusion criteria: use of antidepressant drugs in the prior 90 days, current alcohol abuse, current psychotic symptoms, history of mania, recent use of lithium or antipsychotic medication, current pregnancy, or current use of medications that might contraindicate use of one of the study drugs.

Eligible and consenting patients were randomly assigned to begin treatment with desipramine, fluoxetine or imipramine, with randomization stratified according to presence/absence of current major depression determined by structured interview (17). As reported elsewhere, initial medication assignment had no significant effect on clinical or functional outcomes at any time-point (15). In this report, results for patients from the three randomization groups are combined.

All decisions regarding clinical management (initial antidepressant dose, dosage changes, treatment discontinuation, switch to different antidepressant, frequency of visits, specialty referral) were made by patients and treating physicians as in usual practice. This strategy was consistent with the objective of studying the consequences of initial antidepressant choice under usual care conditions.

Baseline assessment (conducted prior to randomization) included the following:

- the current depression module of the Structured Clinical Interview in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) or SCID (18), a structured assessment of psychiatric diagnoses;
- a structured interview rating using the 17-item version of the Hamilton Depression Rating Scale (HDRS) (19, 20);
- anxiety and depression subscales of the Hopkins Symptom Checklist (SCL), a standard self-rated measure of current psychiatric symptoms;
- the Medical Outcomes Study SF-36 Questionnaire, a self-report measure of health-related quality of life (27).

Each measure was repeated 1, 3, 6, 9, 12, 18 and 24 months after randomization. Follow-up assessments were completed by trained, independent interviewers who were blinded to the treatment assignment and treatment received. Approximately 16% of baseline assessments and 97% of follow-up assessments were conducted by telephone, with the remainder conducted in person. A test–retest reliability study found excellent agreement between in-person and telephone administration of depression measures (22). Medical comorbidity was assessed using the Chronic Disease Score (23), a measure of severity of medical illness computed from pharmacy records.

These analyses were limited to the sample of patients satisfying criteria for DSM-III-R current major depressive episode at the baseline assessment (n = 358). To simplify presentation of results, the sample was further limited to those completing all seven follow-up assessments (n = 225). As reported previously (15), participation in follow-up interviews was not related to any clinical characteristics assessed at baseline or during follow-up. For these analyses, clinical outcomes at each time-point were divided into three categories: major depression, subthreshold depression and remission. Major depressive episode was defined according to DSM-IV criteria as assessed by the SCID. Remission of depression was defined as an HDRS score of seven or less together with absence of major depressive episode at the baseline assessment. The subthreshold depression category included those falling into neither of the above groups.

Primary data analyses were conducted using SPSS software (SPSS Inc, Chicago, IL, USA). Analysis of repeated categorical measures (e.g. probability of remission of depression across multiple time-points) was performed using logistic regression with random effects. This method allows inclusion of multiple observations per person and accounts for clustering or correlation of observations within individuals. Random effects logistic regression models were fitted using the EGRET software package (SERC, Seattle, WA, USA).

**Results**

Of the 225 patients considered in this analysis, 167 (74%) were female, and the mean age was 42 years (range, 18–80 years). At baseline assessment, 79% reported prior episodes of depression, and 40% reported at least two prior episodes; 35% reported...
prior episodes of antidepressant treatment and 6% reported prior hospitalization for depression. Mean HDRS score was 13.8 (SD, 2.5) and mean SCL anxiety score was 1.29 (SD, 0.76). Demographic and clinical characteristics were similar to those in other samples of depressed patients from this (24, 25) and other primary care settings in the USA (26).

**Distribution of follow-up clinical outcomes**

Fig. 1 displays the proportion of patients in each of the three clinical categories, remission, subthreshold depression and major depression, at each follow-up assessment. The proportion of patients meeting criteria for major depression fell to approximately 10% by 6 months and remained at that level for the remainder of the follow-up period. The proportion of patients meeting criteria for remission gradually increased to approximately 45% by 6 months and remained at approximately that level for the duration of the follow-up period. Fig. 2 displays the frequency distribution of two follow-up outcomes, major depression and remission, for all time-points combined. A comparison of these two graphs with the data in Fig. 1 illustrates the fluctuating nature of long-term outcomes. While the probability of major depression at any specific follow-up assessment was approximately 10%, over 40% of patients satisfied criteria for major depression at one or more assessments. Conversely, only 3% of patients met criteria for major depression at more than three of the seven follow-up assessments. Data on remission of depression suggested somewhat greater stability. Probability of remission at any specific assessment ranged from 30% to 50%. Nearly 20% of patients did not meet remission criteria at any assessment. Approximately 35% met criteria for remission at four or more of the seven assessments.

**Stabilization over time**

The data were analysed to assess remission at any specific assessment as a predictor for remission at all subsequent assessments. Remission at the 1-month assessment was only a moderate predictor of remission at 3 months and beyond (odds ratio (OR), 1.51; 95% confidence interval (CI), 1.14–1.97). Remission at 3 months was a stronger predictor of remission at subsequent assessments (OR, 3.65; 95% CI, 2.81–4.76). Parallel analyses showed remarkably similar levels of prediction for the assessments after 6 months (OR, 3.68; 95% CI, 2.78–4.86) and 9 months (OR, 3.10; 95% CI, 2.25–4.27). Similar results were obtained for remission at any specific assessment as a predictor of probability of major depression at all subsequent assessments. Remission at 1 month was a moderate predictor of major depression at 3 months and beyond (OR, 0.70; 95% CI, 0.43–1.14). Remission at 3 months was a better predictor of major depression at long-term follow-up (OR, 0.32; 95% CI, 0.18–0.54), but use of the outcome at 6 months (OR, 0.43; 95% CI, 0.26–0.70) or 9 months (OR, 0.48; 95% CI, 0.27–0.85) did not lead to more accurate prediction. In summary, prediction of long-term outcome (either remission or major depression) based on the 3-month assessment was just as accurate as prediction based on later assessments. This pattern of results indicates that the long-term “trajectory” of depression (the probability of a favourable or an unfavourable outcome) was generally established by 3 months.

**Agreement between clinical outcomes and functional status**

The presentation of these analyses focuses on the 12-month assessment. Table 1 displays scores on each subscale of the SF-36 functional status questionnaire according to clinical outcome (major depression, subthreshold depression or remission). Each subscale of the SF-36 showed a strong stepwise relationship with severity of depression at follow-up. When judged by relative effect size (difference between groups divided by standard deviation), clinical outcome showed the strongest association with the vitality, role-emotional and social functioning subscales. Analyses for other follow-up time-points showed the same pattern of results (details available on request).
Predictors of long-term outcome

The presentation focuses on prediction of remission at the 6-month assessment and all subsequent assessments (i.e. probability of remission averaged across the 6-, 9-, 12-, 18- and 24-month assessments). Various predictors were examined in a series of logistic regression models, with clinical outcome at various time-points treated as a repeated measure (i.e. logistic regression with random effects). There were three categories of predictors: short-term clinical outcome (remission versus no remission at 3 months), baseline characteristics (baseline HDRS score, SCL anxiety score and medical comorbidity as measured by the Chronic Disease Score), and history prior to the baseline assessment (number of prior depressive episodes and duration of the index depressive episode). To facilitate comparison across predictors, continuous measures were converted to dichotomous measures. Chronic Disease Score, baseline HDRS score and baseline SCL anxiety score were all divided at the median value. Duration of the index episode was categorized as greater than or less than 12 months (29% of participants reported a duration of over 12 months). History of prior depressive episodes was categorized as one or fewer prior depressive episodes versus two or more prior episodes (35% of participants reported two or more prior depressive episodes).

Each of these predictors was examined individually (in a logistic regression model including adjustment for age and sex). Results are shown in the left half of Table 2. As expected, outcome at 3 months showed the strongest association with long-term clinical outcome. Surprisingly, baseline severity of depression and history of recurrent depression showed only weak (and not statistically significant) associations with long-term outcome. Baseline anxiety symptoms, level of medical comorbidity and duration of the index depressive episode all showed moderate association with long-term outcome.

The relative contributions of each predictor were examined using a combined model. The 3-month outcome was the strongest predictor of long-term prognosis, and the strength of this relationship was unchanged after including other predictors in the combined model. After adjustment for the 3-month outcome, baseline depression severity showed no association with long-term outcome. Severity of comorbid anxiety symptoms and duration of the index depressive episode retained a moderate association.

### Table 1. SF-36 subscale scores at the 12-month assessment according to depression outcome at 12 months

<table>
<thead>
<tr>
<th>SF-36 subscale</th>
<th>Major depression</th>
<th>Subthreshold depression</th>
<th>Remission</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical function</td>
<td>77 (28)</td>
<td>86 (22)</td>
<td>89 (20)</td>
<td>F = 11.3, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Role-physical</td>
<td>47 (43)</td>
<td>74 (36)</td>
<td>91 (22)</td>
<td>F = 20.9, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Bodily pain index</td>
<td>58 (26)</td>
<td>68 (24)</td>
<td>82 (19)</td>
<td>F = 17.6, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Health perception</td>
<td>66 (25)</td>
<td>68 (23)</td>
<td>80 (16)</td>
<td>F = 10.4, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Vitality</td>
<td>26 (16)</td>
<td>48 (21)</td>
<td>69 (15)</td>
<td>F = 70.1, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Social functioning</td>
<td>56 (24)</td>
<td>79 (24)</td>
<td>95 (11)</td>
<td>F = 46.4, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Role-emotional</td>
<td>31 (38)</td>
<td>69 (37)</td>
<td>91 (21)</td>
<td>F = 40.4, df = 2, P &lt; 0.001</td>
</tr>
<tr>
<td>Mental health</td>
<td>42 (19)</td>
<td>67 (17)</td>
<td>82 (13)</td>
<td>F = 72.6, df = 2, P &lt; 0.001</td>
</tr>
</tbody>
</table>

* Values in parentheses are standard deviations.

### Table 2. Predictors of remission at the 6-month and later follow-up assessments

<table>
<thead>
<tr>
<th>Individual predictors*</th>
<th>Combined model*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
</tr>
<tr>
<td>Remission at 3 months</td>
<td>3.73</td>
</tr>
<tr>
<td>Baseline clinical status</td>
<td></td>
</tr>
<tr>
<td>HDRS score</td>
<td>1.08</td>
</tr>
<tr>
<td>SCL anxiety score</td>
<td>1.68</td>
</tr>
<tr>
<td>Medical comorbidity</td>
<td>1.21</td>
</tr>
<tr>
<td>Clinical history</td>
<td></td>
</tr>
<tr>
<td>&lt;2 prior episodes</td>
<td>1.09</td>
</tr>
<tr>
<td>Index episode &lt;12 months</td>
<td>1.35</td>
</tr>
</tbody>
</table>

* Odds ratios for individual predictors after adjustment for age and sex.

* Odds ratios for combined model including all predictors.
Discussion

There are several limitations to the generalizability of the findings in this study. First, the sample was limited to patients initiating antidepressant treatment — excluding those with unrecognized depression, those untreated and those receiving some alternative treatment. Second, this sample included primarily patients with uncomplicated unipolar depression of moderate severity. Third, the demographic characteristics of the sample (primarily employed, middle-class and well educated) reflect those of employed populations in urban areas in the USA. Fourth, a significant minority of patients did not complete all follow-up assessments and were excluded from this report. However, there is no evidence of bias due to attrition or nonresponse (details available on request). Finally, the study design does not allow an unbiased analysis of the relationship between quality or continuity of antidepressant treatment and clinical outcomes. As discussed below, several recent randomized trials have demonstrated the clinical benefits of more intensive depression treatment in primary care.

Patterns of long-term outcome in this sample do not support a sharp distinction between persistence of depression and relapse or recurrence. For patients in remission at the 3-month assessment, risk of major depression at any specific later assessment was less than 5% and overall risk of major depression at any point during follow-up was only 20%. Conversely, only 15% of patients experiencing major depression at any time during the follow-up period were in remission at the 3-month assessment. A pattern of clear remission followed by full recurrence or relapse (i.e. subsequent major depression) was relatively rare. A major depressive episode during long-term follow-up typically occurred in the setting of persistent subthreshold depressive symptoms, which fluctuated over time.

The data suggest that persistent or recurrent major depression among primary care patients is concentrated in a small proportion of those initiating treatment. Approximately 45% of patients met criteria for major depression at any follow-up assessment. The proportion with major depression at any point after the 3-month assessment was less than 20%. This risk of persistent or recurrent depression is considerably lower than reported for patients treated in specialty clinics (4), but similar to rates reported in primary care samples (5).

In general, clinical outcomes and functional outcomes were closely linked. Severity of depression at follow-up showed a strong and stepwise relationship with impairment across the full range of functional areas. This finding is consistent with abundant evidence from community and primary care studies demonstrating a cross-sectional association between depression and functional impairment (27–29) as well as several studies demonstrating synchrony of change (i.e. where improvement in depression is associated with fewer functional limitations) (30, 31).

Severity of depressive symptoms following acute-phase treatment was the strongest predictor of long-term prognosis. The finding that long-term prognosis was strongly related to degree of recovery from the index episode is consistent with findings in other primary care (5, 12, 13) and specialist clinic samples (10). Results for other risk factors (severity of comorbid medical illness, comorbid anxiety disorder, long duration of the index depressive episode) are also consistent with those in other primary care (5, 12, 13) and specialist clinic samples (2, 4). Most striking is the finding that baseline severity of depression was not a predictor of long-term prognosis after accounting for 3-month clinical outcome. These results reinforce the importance of subthreshold or “minor” depression — especially when it reflects incomplete resolution of a previous depressive episode.

The data indicate that modifiable risk factors influence the long-term prognosis of depression. Factors which are relatively “fixed” at the outset of treatment (prior history of recurrent depression, baseline severity) were less important than factors that might be modifiable by earlier and more effective treatment. Duration of depression prior to initiation of treatment might be reduced by earlier recognition, and severity of depression following acute-phase treatment might be reduced by more intensive acute-phase treatment and systematic follow-up. Clearly, both of these risk factors reflect combinations of modifiable and fixed characteristics. For example, residual depressive symptoms following 3 months of treatment almost certainly reflect both the quality of treatment received and true “treatment resistance” (i.e. stable patient characteristics which predict poor response to appropriate treatment). The observational analyses presented here certainly cannot disentangle the influence of these different factors. However, several recent randomized trials have demonstrated the benefits of systematic depression treatment programmes in primary care (25, 32, 33), with an increase in the proportion of patients recovering from a depressive episode. The findings of the present study reinforce the possibility that more systematic and effective depression treatment programmes might have an important effect on long-term course and reduce the overall burden of chronic and recurrent depression.

Acknowledgements

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Résumé

Pronóstico a largo plazo de la depresión en la atención primaria

La depresión se conceptualiza cada vez más como una enfermedad crónica o recurrente. En estudios anteriores sobre su pronóstico a largo plazo se han identificado varias variables predictivas de la depresión crónica o recurrente, algunas de las cuales son inalterables (p. ej., los antecedentes de depresión recurrente), mientras que otras son susceptibles de modificación mediante tratamiento (p. ej., resolución incompleta del episodio depresivo índice).

En este artículo se emplean los datos longitudinales correspondientes a una muestra de pacientes de atención primaria con objeto de examinar el pronóstico a largo plazo de la depresión. Una muestra de 225 pacientes que empezaron a someterse a tratamiento antidepresivo en un contexto de atención primaria fueron evaluados en lo que respecta a sus resultados clínicos (escala de Hamilton para la depresión y módulo sobre el estado de ánimo de la entrevista clínica estructurada del Manual Diagnóstico y Estadístico de las Enfermedades Mentales, 3ª Ed.) y sus resultados funcionales (cuestionario SF-36) al cabo de 1, 3, 6, 9, 12, 18 y 24 meses de iniciado el tratamiento.

La proporción de pacientes que siguieron cumpliendo los criterios de remisión grave cayó con rapidez hasta aproximadamente un 10% y se mantuvo en torno a ese nivel al largo del seguimiento. La proporción que satisface los criterios de remisión (puntuación de 7 o menos en la escala de Hamilton para la depresión) aumentó progresivamente hasta alcanzar un 45%. Los resultados clínicos a los tres meses se revelaron como una variable predictiva relativamente eficiente del pronóstico a largo plazo; y el uso de datos correspondientes a puntos más alejados en el tiempo no mejoró la exactitud de la predicción. Se observó una estrecha relación entre unos resultados clínicos favorables y unos resultados funcionales favorables. El pronóstico a largo plazo (esto es, la probabilidad de remisión a los seis meses y posteriormente) resultó estar fuertemente relacionado con el estado de remisión a los tres meses (OR: 3,33; intervalo de confianza del 95%: 2,68-4,13) y sólo ligeramente relacionado con diversas características clínicas evaluadas en la situación basal (p. ej., antecedentes de depresión recurrente, comorbilidad médica, síntomas de ansiedad concomitantes). Los resultados no
permiten establecer una distinción clara entre la persistencia de la depresión y las recidivas o recaídas. Los casos de depresión grave detectados durante el seguimiento se asociaron a menudo a una recuperación incompleta, más que a una recuperación completa seguida de recaída. Sorprendentemente, no se observó que los antecedentes de depresión recurrente y la gravedad de la depresión en la situación basal fuesen variables predictivas importantes de los resultados a largo plazo. La variable con más valor de predicción del pronóstico a largo plazo fue la persistencia de síntomas depresivos residuales a los tres meses de comenzada la terapia, factor éste que al menos es potencialmente modificable mediante tratamiento.

Quizá no se pueda generalizar estos resultados a otras poblaciones del nivel de atención primaria, especialmente de aquellas en que los sistemas de reconocimiento y tratamiento de la depresión no coinciden con los propios de los ambulatorios de atención primaria de los Estados Unidos. Sin embargo, los resultados indican que en el pronóstico a largo plazo de la depresión influyen factores de riesgo potencialmente modificables. Ello lleva a pensar que unos programas más sistemáticos y eficaces de tratamiento de la depresión podrían tener un efecto importante en la evolución de la enfermedad a largo plazo y reducir la carga global de depresión crónica y recurrente.

References