4 Fava GA, Freyberg HJ, Bech P, Christodoulou G, Sensky T, Theorell T, Wise TN: Diagnostic criteria for use in psychosomatic research. Psychother Psychosom 1995;63:1–8.
5 Freeman EW, Sammel MD, Liu L, Gracia CR, Nelson DB, Hollander L: Hormones and menopausal status as predictors of depression in women in transition to menopause. Arch Gen Psychiatry 2004;61:62–70.
6 Snaith RP, Constantopoulos AA, Jardine MY, McGuffin P: A clinical scale for the self-assessment of irritability. Br J Psychiatry 1978;132:164–171.
7 Greene JG: A factor analytic study of climacteric symptoms. J Psychosom Res 1976;20:425–430.
8 Soldatos C, Dikeos D, Paparrigopoulos T: Athens Insomnia Scale: validation of an instrument based on ICD-10 criteria. J Psychosom Res 2000;48:555–560.

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## Sickness Absence Trends during and after Long-Term Psychotherapy and Antidepressant Medication among Depressive Employees

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Favourable short-term outcomes for psychotherapy interventions targeted on depressive patients have been shown [1, 2], but few studies have examined long-term outcomes in working populations [3]. We used data on recorded sickness absence as an outcome to examine psychotherapy and pharmacotherapy in a large contemporary working population (the 10-Town Study) [4].

The eligible population comprised all 67,106 employees of the local government who had been employed for at least 10 months in 1 year between 1994 and 2002 [5]. We identified three groups: first, those 448 employees who were granted psychotherapy as a treatment for clinically diagnosed depression (ICD-9 codes 296 and 3004; ICD-10 codes F32, F33 and F34) by the Social Insurance Institution of Finland; second, 3,177 employees treated with antidepressants for at least 12 months during the follow-up, and third, 53,116 healthy controls with no indication of depression. We did not include employees with psychotic symptoms in any of the groups.

We used the participants' personal identification numbers to derive registered data on psychotherapy granted by the Social Insurance Institution, including the main diagnosis and the years psychotherapy was granted. A requirement for granting is the identified need for rehabilitation, the suitability for psychotherapy and the expected gain from psychotherapy explicitly affirmed in a statement by a treating psychiatrist, after a minimum of 6 months' follow-up and treatment.

The prescription register of the Social Insurance Institution of Finland is comprised of out-patient prescription data classified according to the WHO Anatomical Therapeutic Chemical (ATC) classification code [6]. We extracted all the prescriptions coded as N06A, which is the ATC code for antidepressants, from January 1, 1994 to December 31, 2002. To identify clinically depressed cases by ICD-9 or ICD-10 criteria from the antidepressant group, we extracted data on the diagnosis of depression (ICD-9 codes 296 and 3004; ICD-10 codes F32, F33 and F34) from the National Hospital Discharge Register and the sickness absence register of the Social Insurance Institution (these diagnoses have been recorded in all cases from the year 1997 onwards, but before that only for a 10% random sample of the population; a subgroup of 363 antidepressant users with clinically verified depression was identified).

We obtained sickness absence data from the employers' registers containing electronic records on the dates of sick leaves for each employee. We considered only medically certified sick leaves lasting >21 days, as earlier research suggests a stronger association of long-standing illnesses, such as depression, with sickness absence longer than 21 days than with shorter durations [7]. For the non-treated employees, the sickness absences were linked to the data in the same manner as for the cases, on the basis of a randomly assigned year.

Altogether, 43,966 sick leaves longer than 21 days were recorded for the participants during the 7-year follow-up. The mean time of follow-up (days at risk) for sickness absence was 4.53 (SD 2.0) years for the psychotherapy cases, 4.20 (SD 2.1) for the antidepressant cases and 4.87 (SD 1.93) for the healthy controls.

A within-group comparison based on Poisson regression analysis with the generalized estimating equations method [8, 9] showed that the rate ratio of sickness absence at the end of the entire follow-up, compared with that during the treatment, was 0.56 (95% CI = 0.42–0.77) for the psychotherapy cases and 0.62 (95% CI = 0.55–0.70) for the antidepressant treatment cases. For the healthy controls, it was 1.41 (95% CI = 1.37–1.47). When the analyses were restricted to participants who remained in employment in the target organizations until the end of the follow-up period, the results remained essentially the same, suggesting that our findings were not attributable to selection bias due to dropout of the sickest persons from the follow-up.

For both sexes, absence rates during the treatment were 4.3–6.3 times higher in the psychotherapy and antidepressant groups than among the healthy controls, but 6 years after the end of the treatment they were only 1.9–2.5 times higher. A corresponding pattern was seen for different lengths and combinations of therapies (table 1).

According to an additional analysis, both the psychotherapy groups and the subgroup treated by antidepressants and additionally confirmed as having clinical depression had a higher rate of

**Table 1.** Sickness absence (>21 days) among the employees with psychotherapy for depression and those with antidepressant treatment compared to the healthy controls by sex, length of treatment and combination of therapies

| Type of treatment | N | Rate ratio for sickness absence | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | during treatment | year 1 after treatment | year 2 | year 3 | year 4 | year 5 | year 6 |
| *Men* | | | | | | | | |
| Psychotherapy group | 62 | 6.33 (3.63–11.05) | 4.10 (2.22–7.57) | 3.49 (1.73–7.03) | 3.64 (1.61–8.23) | 2.92 (1.48–5.76) | 2.70 (1.32–5.54) | 2.53 (1.12–5.69) |
| Antidepressant group | 579 | 4.91 (4.27–5.64) | 2.87 (2.36–3.49) | 2.19 (1.73–2.77) | 2.14 (1.69–2.71) | 1.93 (1.45–2.55) | 2.05 (1.51–2.79) | 2.09 (1.49–2.92) |
| Healthy controls | 14,531 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| *Women* | | | | | | | | |
| Psychotherapy group | 386 | 4.99 (4.22–5.90) | 3.21 (2.56–4.03) | 2.56 (2.01–3.26) | 2.77 (2.20–3.49) | 2.18 (1.68–2.84) | 2.39 (1.79–3.19) | 2.29 (1.62–3.23) |
| Antidepressant group | 2,598 | 4.33 (4.05–4.63) | 2.56 (2.34–2.80) | 2.33 (2.11–2.57) | 2.29 (2.07–2.52) | 2.22 (2.00–2.48) | 2.06 (1.81–2.35) | 1.93 (1.67–2.24) |
| Healthy controls | 38,585 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| *1-year treatment* | | | | | | | | |
| Psychotherapy group | 152 | 5.99 (4.70–7.64) | 4.96 (3.62–6.80) | 2.77 (1.80–4.25) | 3.49 (2.46–4.96) | 2.33 (1.54–3.53) | 2.52 (1.54–4.14) | 1.60 (0.97–2.65) |
| Antidepressant group | 1,951 | 4.49 (4.18–4.83) | 2.47 (2.24–2.72) | 2.23 (2.00–2.49) | 2.22 (2.00–2.47) | 2.21 (1.97–2.48) | 2.13 (1.86–2.43) | 2.04 (1.75–2.37) |
| Healthy controls | 53,116 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| *2-year treatment* | | | | | | | | |
| Psychotherapy group | 259 | 4.77 (3.86–5.90) | 2.60 (1.97–3.44) | 2.67 (2.02–3.52) | 2.46 (1.80–3.34) | 2.35 (1.71–3.21) | 2.30 (1.64–3.22) | 2.73 (1.85–4.03) |
| Antidepressant group | 577 | 4.36 (3.92–4.84) | 2.64 (2.22–3.15) | 2.47 (2.03–3.01) | 2.12 (1.69–2.67) | 2.03 (1.59–2.59) | 1.71 (1.23–2.36) | 1.57 (1.17–2.10) |
| Healthy controls | 53,116 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| *3- to 4-year treatment* | | | | | | | | |
| Psychotherapy group | 37 | 5.95 (3.56–9.95) | 0.73 (0.16–3.35) | 2.04 (0.84–4.97) | 3.61 (1.58–8.23) | 1.60 (0.59–4.35) | 3.39 (1.42–8.12) | – |
| Antidepressant group | 386 | 4.39 (3.87–4.97) | 3.45 (2.82–4.22) | 2.56 (1.99–3.28) | 2.60 (2.06–3.29) | 2.20 (1.59–3.04) | 2.13 (1.32–3.43) | – |
| Healthy controls | 53,116 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | – |
| *Combination of therapies* | | | | | | | | |
| Psychotherapy + antidepressant | 143 | 7.84 (6.21–9.91) | 4.17 (2.97–5.85) | 2.68 (1.83–3.92) | 4.15 (3.04–5.67) | 2.87 (1.97–4.18) | 2.85 (1.81–4.48) | 2.90 (1.75–4.82) |
| Psychotherapy only | 305 | 3.91 (3.18–4.81) | 2.92 (2.22–3.83) | 2.67 (2.01–3.55) | 2.23 (1.63–3.05) | 2.01 (1.46–2.76) | 2.24 (1.61–3.13) | 2.04 (1.37–3.04) |
| Antidepressant only | 3,177 | 4.42 (4.16–4.69) | 2.60 (2.39–2.82) | 2.31 (2.11–2.53) | 2.24 (2.05–2.46) | 2.18 (1.97–2.42) | 2.06 (1.82–2.32) | 1.95 (1.70–2.23) |
| Healthy controls | 53,116 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Rate ratios (95% CIs in parentheses) are derived from a repeated-measures Poisson regression analysis with generalized estimating equations adjusted for age, sex, occupational status, type of employment contract and the year therapy started.

sickness absence than the healthy controls. The rate of sickness absence was lower in the psychotherapy group than in the antidepressant subgroup (the overall rate ratio during the 6-year post-treatment period was 0.74, 95% CI = 0.60–0.90). However, if this comparison was restricted to the 89 psychotherapy cases selected by the same criteria as the antidepressant subgroup, there was no difference between the two treatment groups (rate ratio = 1.18; 95% CI = 0.86–1.61).

In conclusion, our data suggest that long-term psychotherapy for depression, as well as antidepressant treatment, are associated with a substantial reduction in sickness absence for at least 6 years after the end of the treatment in a large occupational cohort. However, several limitations are noteworthy. Firstly, because we used a non-randomized quasi-experimental design, selection bias is a potential problem. Furthermore, in the main analysis the antidepressant group was identified solely based on filled antidepressant prescriptions that are not always prescribed for depression. However, a sensitivity analysis for a subgroup with antidepressant use and diagnosed depression revealed a largely similar declining pattern of sickness absences (although with a higher overall rate). This suggests that a major bias is unlikely. Second, the psychotherapy received by our study population was heterogeneous and the psychotherapists had diverse theoretical backgrounds (e.g. psychodynamic or cognitive). Third, we had no data on spontaneous recovery. The Social Insurance Institution of Finland provides reimbursement for psychotherapy only if the patient had a history of a minimum of 6 months' treatment by the treating psychiatrist. Thus, the psychotherapy cases had long-standing depression with a documented decrease in functional capacity rather than mild depression with a high rate of spontaneous recovery. However, part of our findings may be explained by insufficient assessment of treatment adequacy or spontaneous recovery.

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*References*

1 Matt GE, Navarro AM: What meta-analyses have and have not taught us about psychotherapy effects: a review and future directions. Clin Psychol Rev 1997;17:1–32.
2 Lipsey MW, Wilson DB: The efficacy of psychological, educational and behavioural treatment: confirmation from meta-analysis. Am Psychol 1993;48:1181–1209.
3 Gabbard GO, Gunderson JG, Fonagy P: The place of psychoanalytic treatments within psychiatry. Arch Gen Psychiatry 2002;59:505–510.
4 Vahtera J, Pentti J, Kivimäki M: Sickness absence as a predictor of mortality among male and female employees. J Epidemiol Community Health 2004;58:321–326.
5 Suoyrjö H, Hinkka K, Kivimäki M, Klaukka T, Pentti J, Vahtera J: Allocation of rehabilitation measures provided by the Social Insurance Institution in Finland: a register linkage study. J Rehabil Med 2007;39:198–204.
6 WHO Collaborating Centre for Drug Statistics Methodology: Guidelines for ATC Classification and DDD Assignment. Oslo, WHO Collaborating Centre for Drug Statistics, 2004.
7 Marmot M, Feeney A, Shipley M, North F, Syme SL: Sickness absence as a measure of health status and functioning: from the UK Whitehall II study. J Epidemiol Community Health 1995;49:124–130.
8 Lipsitz SH, Kim K, Zhao L: Analysis of repeated categorical data using generalized estimating equations. Stat Med 1994;13:1149–1163.
9 Vahtera J, Pentti J, Helenius H, Kivimäki M: Sleep disturbances as a predictor of long-term increase in sickness absence among employees after family death or illness. Sleep 2006;29:673–682.

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