DEPRESSION IN YOUNG ADULTS WITH CHRONIC SOMATIC ILLNESS – AN ANALYSIS OF 1970 BRITISH COHORT STUDY

Alexandra I. Mihailescu¹, Valentin P. Matei², Liliana V. Diaconescu³, Ruxandra Al-Bataineh⁴, Traian Purnichi⁴

Abstract
The prevalence rate of depression occurring in people with somatic illnesses is 3 times more than people without somatic illnesses, but less research was conducted in this respect for people with early onset of somatic disease. Taking into account that the presence of depression in chronic patients aggravates the somatic disease, leading to a poor prognosis and higher rates of mortality it is important to detect and treat it.

The purposes of our study are to analyse in a large cohort (BCS-70) the risk of depression in patients with somatic illness at early ages (less or equal 30 years).

Methods
Data used in our paper were drawn from the 1970 British Cohort Study (BCS70). The design and conduct of this study have been described elsewhere (1). Data for the present paper are drawn from 30 years wave. The data were analysed with descriptive function, chi-square and logistic regression. All analyses were performed using SPSS 16.

Results
At age 30, we have found 1409 people (12.7%) with depression. From a total of 11211 people there are 860 people with hypertension (7.7%) and 109 people with diabetes (1%). There is an increased risk of depression in the case of people with „pure” hypertension or „pure” diabetes (p<0.05). In the case of people with both hypertension and diabetes, logistic regression showed that hypertension is a risk factor for depression irrespective of socio-economic status and diabetes (Exp(B)=1.970, CI=1.579-2.458, p=.001).

Conclusion
The above data indicate that risk of depression is higher in people with onset before 30 years old of hypertension and/or diabetes. Our study did not identify an increased risk for depression by socio economic class.

Data of our study clearly suggests that it is extremely important that young patients with somatic diseases like diabetes and/or hypertension should be aggressively screened and treated for depression.


Key words: depression, chronic somatic illness, young adult, diabetes, hypertension

Introduction
Depression represents a major cause of morbidity and mortality (1). The prevalence of depression is increasing (2) and by 2012 it is reported to be among the first 10 diseases causing loss of years due to disability (3). Depression is responsible for the greatest proportion of burden associated with non-fatal health outcomes accounting for approximately 10% total years lived with disability(4), more than cardiovascular disorders (2.8%), diabetes (3.0%), or chronic respiratory diseases (6.3%) (3).

Chronic somatic illnesses are the cause of significant burden on individuals, families, societies and countries. Chronic somatic diseases that are frequent in the age group 18-44 years old are cardiovascular disease (most frequent hypertension – reported frequencies between 1.4%(5) and 8.7% (6)), cancer (aprox 2% prevalence (7)), diabetes (reported frequencies 1.4%(5) to 2.6%(8)) and respiratory diseases (aprox 4%(5)).

The most frequent chronic medical conditions associated with depression are: heart disease(9,10), hypertension(11), diabetes (12,13), asthma (14). The prevalence rates of depression occurring in people with somatic illnesses is two (15) to three (16) times more than people without somatic illnesses. In patients with two or more chronic medical conditions the risk of depression is six times higher compared with healthy persons(17).

Many studies focused on co-morbidity of depression with one single chronic condition. Researchers found a high prevalence of depression in people with diabetes, its rates varying by diabetes type and among developed and developing nations (18). The prevalence of depression in diabetes patients may range between 2 and almost 30%.
Depression In Young Adults With Chronic Somatic Illness – An Analysis Of 1970 British Cohort Study

Alexandra I. Mihailescu

The 1970 British Cohort Study (BCS70) is a cohort study that enrolled 16,567 babies born in England, Scotland, and Wales on 5-11 April 1970 (19-23), with higher values found in patients with type 2 diabetes (24,12) and among females with diabetes (25). Prevalence in diabetic group age 18-44 years old is less than 5% (8). Young adults with diabetes face difficulties with diabetes self-management and co-morbidity with depression is deteriorating even more diabetes adaptation (26,27).

The burden of comorbidity
Morbid mortality and mortality in patients with somatic illnesses and depression are significantly higher than in patients with somatic illness who are not depressed. These patients face many negative health consequences: they present more severe somatic symptoms and complications (28), have poor outcomes of somatic disease and more functional disability (29), a lower quality of life (30,31), a low treatment adherence (32,33), an increased use of medical services (34,35) and higher health care costs (36,38).

Co-morbid depression among patients with diabetes is associated with poor diabetes outcomes (such as glycemic control), with more and greater complications (such as diabetic retinopathy, nephropathy, neuropathy) with functional disability (-3941), with a lower quality of life (23), with a decreased adherence (35) and with higher healthcare costs (42).

Another relevant example is the link between hypertension and depression. Clinical studies show that depression is common in patients with hypertension, has a certain influence in blood pressure control and a significant impact on severity of hypertension (43,44).

Depressive symptoms have been found to be predictive of hypertension in young adults (45). The association between cardiovascular illness and depression has multiple biological and clinical links and is likely bidirectional. Most cited pathophysiological mechanisms are hormonal variations, metabolic abnormalities, hypercoagulability, increased platelet aggregation, inflammation, and endothelial dysfunction (46,47). Depression is most likely aggravating the associated cardiovascular disease by impeding the optimal care for this people.

The importance of depression detection.
Although depression has a high prevalence and it is present in patients with chronic somatic illnesses, depression among these patients remains often undetected (19,37). Although depression is highly prevalent in individuals with multimorbidity, studies on the rates and correlates of depression in these individuals are scarce (48).

People aged less than 30 have a prevalence of somatic illness less than 10%, however, a chronic disease that begins early will result in a worse overall prognosis of the person affected (49). In this respect, our study is attempting to study if there is an increased risk for depression for people with two frequent somatic illnesses, hypertension and diabetes at age 30. Because the association between these two illnesses is quite common, we looked at the increasing or risk for depression not only in pure diabetes and hypertensive groups but also in increasing the risk for depression in comorbid group (i.e. hypertension and diabetes). Methods

Data used in our paper were drawn from the 1970 British Cohort Study (BCS70). The 1970 British Cohort Study (BCS70) is a cohort study that enrolled 16,567 babies born in England, Scotland, and Wales on 5-11 April 1970 (50,51). The original study focused on children health and has successively expanded to examine physical, educational and social development of these children. Individuals participating in this cohort study were assessed at birth with a 96.7% response rate and in ongoing follow-ups using a multi-method, multi informant approach. Participants were followed up at 5 (n = 13,135, in 1970), 10 (n = 14,875 in.), 16 (n = 11,622 in 1986), 26 (n=9003, in 1996), 30 (n = 11,261 in 2000) and 34 (n=9656, in 2004) years of age.

At 30 years, marked efforts were made to recruit difficult-to-reach subjects (51). Data for the present paper are drawn from 30 years wave (52).

Measure of depression. At age 30, data was collected on the severity of depressive symptoms using The Malaise Inventory. An overall Malaise score for a cohort member is the sum across the individual variables, yielding a minimum score of 0 and a maximum of 24. A score of 8 or higher is a recommended cut-off for a depressive episode (53).

Measure of hypertension and diabetes. Data about somatic illnesses were obtained from patients. At age 30 people from cohort were asked: “Have you ever had or been told you had high blood pressure?” “Have you ever had diabetes?” They could respond with “yes”, “no”, “don’t know” and “not answered”. We excluded from the analysis the last 2 groups of responders.

Measure for socio-economic status. Data about social class of people from cohort were used as proxy for socio-economic status (ses). Social classes were defined as such: “Professional”, “Managerial-technical”, “Skilled non-manual”, “Skilled manual”, “Partly skilled” and “Unskilled”.

Statistical analyses. We created 2 groups, the first one comprised of people considered controls (overall Malaise score less or equal 7), the second one assumed to have depression (Malaise score of 8 or over). The data were afterwards analysed with descriptive function, chi-square and logistic regression. All analyses were performed using SPSS 16.

Results.
Descriptive data. From a total of 11211 people there are 860 people with hypertension (7.7%) and 109 people with diabetes (1%). From a total of 11211 people 1409 (12.6%) have depression, and from this, 193 have developed hypertension (high blood pressure) and 27 have developed also diabetes, as it is shown in the figure below.
Data were first analysed with chi square. The proportion of people with depression in the hypertension group is higher 21.5% (183 out of 852) than the proportion of depression in non-hypertensive group 11.9% (1225 out of 10256), OR =2.017, CI=1.694-2.400, p=.001. The proportion of people with depression in the diabetes group is also higher 24.8% (27 out of 109) than the proportion of depression in non-diabetes group 12.6 % (1382 out of 11003), OR=2.922, CI=1.478-3.554, p=.001.

**Socio-economic status.** It is virtually impossible to evaluate the causality in a cross-sectional study like this wave of the cohort. However, due to the fact that socio-economic status may influence hypertension, diabetes and depression, we analysed data to see this putative influence. Our analysis showed that socio-economic status did influence hypertension (Exp(B)=.879 CI=.797-.969, p=.009), depression (Exp(B)=1.288, CI=1.118-1.398, p=.001) but not diabetes (Exp(B)=1.081, CI=1.811-1.440, p=.597).

Moreover, there is also possible that people with hypertension may be at risk for diabetes, and therefore we analysed data (chi square) and indeed, people with hypertension have a higher proportion of diabetes 3.7% (32 out of 860) compared with people with diabetes but without hypertension 7% (77 out 10347), (OR 5.155, CI=3.393-7.832, p=.001).

Because the possible influences between variables are intricate (socio-economic status may influence somatic illnesses but also depression, somatic illness may increase depression risk and depression may increase risk for somatic illnesses or decrease socio-economic status and somatic illnesses may increase the risk for the other somatic illness) we decided to analyse all the data with logistic regression using depression as dependent variable and hypertension and diabetes as independent variable, while controlling for socio-economic status. In this model depression risk is increased by hypertension (Exp(B)=1.970, CI=1.579-2.458, p=.001) and socio-economic status (Exp (B)=1.280, CI=1.180-1.389, p=.001) but it is not increased by diabetes (Exp (B)=1.623, CI=.859-3.065, p=.135).

The above data seem to indicate that hypertension is a risk factor for depression irrespective of socio-economic status and diabetes. However, when we analysed data only for people with diabetes but without hypertension (chi square, without controlling for socio-economic status because we already seen from previous presented analyses that socio-economic status didn't influence diabetes risk) it appeared that diabetes also increased risk for depression, 21.1% from diabetes group (17 out 77) and 11.9% (1208 out of 10179) from healthy people, p<0.05 (see table below).

We looked for risk of hypertension but without diabetes, while controlling for socio-economic status (because socio-economic status did influence, as seen from previous analyses hypertension and depression risk). There is an increased risk for depression in “pure” hypertension group (hypertension without diabetes), p<0.05 (see table below). We are also looking in group comprised of people with hypertension and diabetes while controlling for socio-economic status and there again it is an increased risk comparing with normal group, p<0.05 (see table below).

Data resulting from logistic regression are shown in the table below.

<table>
<thead>
<tr>
<th>Risk for depression in BCS70</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>High blood pressure and</td>
</tr>
<tr>
<td>diabetes</td>
</tr>
</tbody>
</table>

**Table1. Risk for depression in the chronic illness groups formed in BCS70 cohort**

**Discussion**

Our study supports that both diabetes and hypertension increased depression risk, which replicates results from previous studies – (24,13,19,48,45,546). We would have preferred to have more objective data about the presence chronic somatic illnesses at 30 years adults. However, the only questions from the cohort which could have offered more objective data “Subject seen a doctor for high Blood Pressure in past 12 months?” and “Subject seen a doctor for diabetes in past 12 months?” come with huge numbers of missing questions (10914 for the first one and 11178 for the second one leaving to few subjects to be analysed 295 for hypertension and 78 for diabetes) and no control group, therefore impossible to analysed. The lack of more objective information regarding somatic illnesses represents one important weakness of our study.

However, strength of our study is that it looked into the association between the 2 illnesses, which is rather rare in this kind of study. Results of our study suggest that the risk is a little bit higher in co-morbid group, but the augmentation of this risk is not quite significant. Moreover, our study controlled the data for socio-economic status, which is rare in this kind of study.

One more important observation is the fact that people included in analysis are young, while other studies of this kind looked in rather older population (49,57,58). The young age of onset of chronic illness indicates that they may be predisposed to more severe evolution. The pervasive impact of depression on quality of life and its potential negative effect on chronic disease management warrant aggressive screening and clinical interventions appropriate to each country’s healthcare system in young adults with diabetes and/or hypertension.

**References**

Depression in Young Adults With Chronic Somatic Illness – An Analysis Of 1970 British Cohort Study

Alexandra I. Mihailescu


