

# First episode psychosis and weight gain a longitudinal perspective in Cheshire UK: a comparison between individuals with nonaffective versus affective psychosis

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**Introduction** Early weight gain following initiation of antipsychotic treatment predicts longer-term weight gain, with attendant long-term consequences including premature cardiovascular events/death. An important question is whether there is a difference in weight change over time between people with affective versus nonaffective psychosis. Here we describe the results of a real-world analysis of the BMI change in the months postdiagnosis with affective versus nonaffective psychosis.

**Methods** We undertook an anonymised search across one Primary Care Network in Cheshire, UK with a total population of 32 301 individuals. We reviewed the health records of anyone who had been diagnosed over a 10-year period between June 2012 and June 2022 for the first time with first episode nonaffective psychosis versus psychosis associated with depression or bipolar affective disorder (affective psychosis).

**Results** The overall % change in BMI was +8% in nonaffective psychosis individuals and +4% in those with a diagnosis of affective psychosis – however, the distribution was markedly skewed for nonaffective psychosis patients. Using caseness as >30% increase in BMI; affective = 4% cases and nonaffective = 13% cases,

there was a three-fold difference in terms of increase in BMI. In regression analysis, the  $r^2$  linking the initial BMI to % change in BMI was 0.13 for nonaffective psychosis and 0.14 for affective psychosis.

**Conclusion** The differences observed here in the distribution of weight change over time between individuals with affective versus nonaffective psychosis may relate to underlying constitutional differences. The phenotypic and genetic factors underlying this difference remain to be defined. *Cardiovasc Endocrinol Metab* 12: 1–6 Copyright © 2023 The Author(s). Published by Wolters Kluwer Health, Inc.

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## Introduction

Weight gain after diagnosis/treatment for first-episode psychosis (FEP) is a major predictor of future diabetes, dysmetabolic profile, and increased cardiometabolic risk in people treated with antipsychotic agents [1,2]

Early weight gain is a predictor of longer-term weight gain, with the attendant long-term consequences including premature cardiovascular events and death [3]. Genetic factors likely play a significant part in the degree to which weight gain occurs [4].

Considerable variability in weight gain and metabolic effects exists between individuals [5]. Young and antipsychotic-naïve patients are at particularly high risk [6].

The matter of predicting who is going to put on weight subsequent to initiation of antipsychotic treatment remains a major issue for health care professionals working in psychiatry, as also for service users. At present risk prediction models are poor [7]. A question related to this is the matter of whether there is a difference in weight change over time between people with affective versus nonaffective psychosis.

Here we describe the results of a real-world analysis of the BMI change in the months after diagnosis with affective versus nonaffective psychosis, based in one area of the UK.

## Materials and methods

We undertook an anonymized search across one primary care network (PCN) in Cheshire, UK with a total practice population of 32 301 individuals. The population in which the search was conducted is based in North-Eastern Cheshire, UK.

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The sample was selected using a search across one PCN in England using the search facility which is part of the GP operating system EMIS. We included all people diagnosed with psychosis of any kind in the previous 20 years.

We reviewed the health records of anyone aged 18 years or over who had been diagnosed for the first time diagnosed over a 10-year period between June 2012 and June 2022 with FEP, schizophrenia, schizoaffective disorder, and delusional disorder (nonaffective psychosis). We examined the BMI in the period before and after the first prescription of antipsychotic medication. We compared changes in the BMI for individuals diagnosed with psychosis associated with depression or bipolar affective disorder (affective psychosis).

The average of up to three BMI measurements from both before and after medication were started, was calculated. The difference was taken as % of the before-medication BMI versus after the start of medication BMI to derive % change over time.

Linear regression modelling was used to identify the degree of association between change in BMI over time and initial BMI.

## Results

Diagnostic data available was available on 480 people. One hundred four had BMI measured at least three times in the years both immediately before and after the medication was prescribed.

Individuals were then split according to diagnosis as 50 nonaffective psychosis patients and 54 affective psychosis individuals with the analysis breakdown given in Table 1. There was a higher proportion of women in both groups for whom sufficient follow-up BMI data was available. Follow-up period was up to 10 years after first antipsychotic prescription.

For people on olanzapine and quetiapine, prescribing was 50% higher in people with nonaffective psychosis versus affective psychosis but similar for risperidone, and aripiprazole. Three of the nonaffective psychosis individuals were treated with depot antipsychotic injections.

The overall % change in BMI was +8% in nonaffective psychosis individuals (Fig. 1) and +4% in those with a diagnosis of affective psychosis (Fig. 2) – however, the distribution was markedly skewed for nonaffective psychosis patients, with no difference in mean BMI change between men and women for this group.

Using caseness as  $\geq 30\%$  increase in BMI; affective = 4% cases and nonaffective = 13% cases – this was a three-fold difference in terms of increase in BMI. For the affective disorder individuals, the skewness of the distribution of BMI change was 0.4. For the nonaffective

individuals, the skewness was 1.1. There was no significant difference between nonaffective psychosis and affective psychosis individuals for BMI change of  $\geq 20\%$  or  $\geq 10\%$  (Table 2).

The relation between baseline BMI and change in BMI was similar in both affective and nonaffective psychosis (Figs. 3 and 4). In regression analysis, the  $r^2$  linking the initial BMI to % change in BMI was 0.13 for nonaffective psychosis and 0.14 for affective psychosis, and slope value was similar at  $-0.012$  (Figs. 3 and 4).

## Discussion

We have here shown that the distribution of weight change after initiation of treatment for psychosis is different in those people with a diagnosis of affective versus nonaffective psychosis and that weight change was greater on average for people with nonaffective versus affective psychosis at 8% versus 4% over a median month.

Weight gain when associated with nonaffective disorder was skewed with a proportion of individuals showing very significant weight gain (Fig. 1). This is in accordance with previous studies looking at weight trajectory in this group of people [7,8]. The choice of antipsychotic agent has multiple influences with polypharmacy likely a factor [5,9,10].

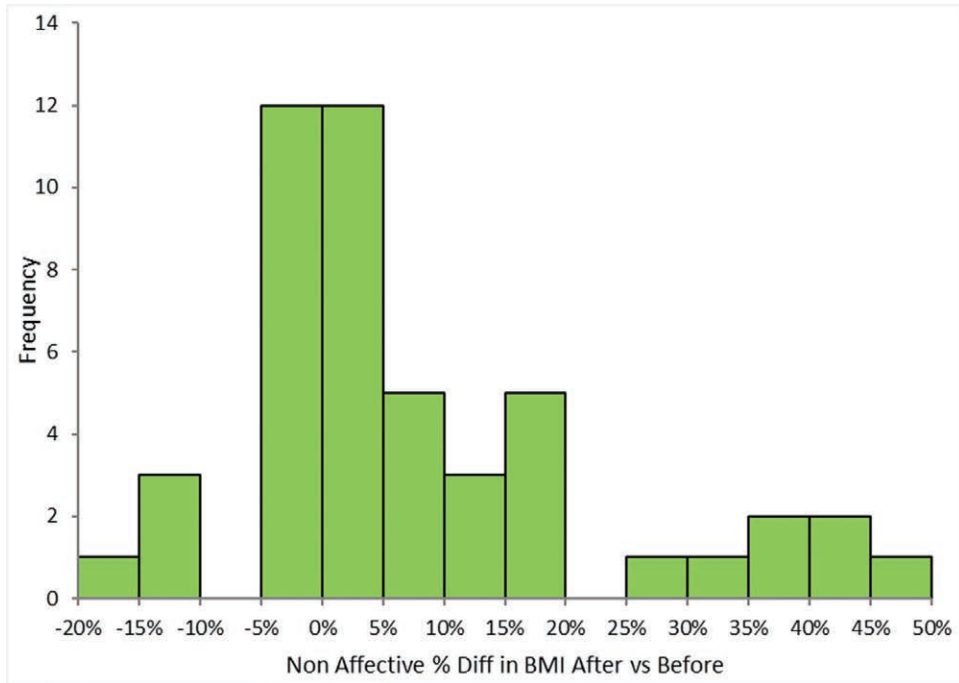
The difference in the degree of weight change may well relate to the difference in prescribing practice for those diagnosed with affective psychosis versus nonaffective psychosis, the latter group being more likely to receive antipsychotic agents long-term as seen here. The higher rates of antipsychotic prescribing seen here accord with the description of Ventriglio *et al.* [11] who found that patients with schizophrenia versus bipolar disorder were being prescribed 3–7 times more psychotropic medication. They also found that psychotropic treatment regimes were more complex, and metabolic measures more abnormal among bipolar disorder individuals.

The ability to identify which patients are at risk of initial weight gain would be invaluable knowledge for clinicians, enabling more focus on preventing initial weight gain [12,13]. While we are not able to look at risk/protective factors here, we feel that the difference between the broad groups that we have described may

**Table 1 Description of the groups**

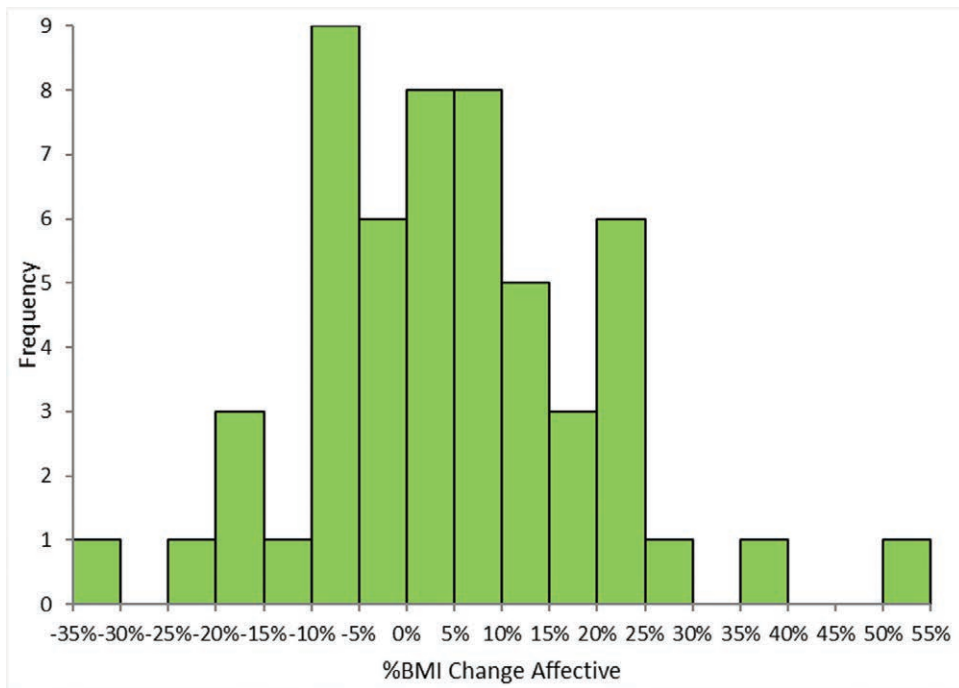
	Affective	Nonaffective
Number of people	55	50
of which males	23 (42%)	22 (44%)
Average age at initiation (years)	49.1	45.6
Average Townsend Score (more positive score indicates greater social disadvantage)	-2.1	-1.9
Mean BMI before (kg/m <sup>2</sup> )	27.6	26.9
Mean BMI after (kg/m <sup>2</sup> )	28.5	29.1
Average % BMI change	4.3%	8.2%

Fig. 1



Distribution of initial BMI and % change in BMI in nonaffective psychosis.

Fig. 2



Distribution of initial BMI and % change in BMI in affective psychosis.

provide some guidance as to what is different between people with affective and nonaffective psychosis in relation to their propensity to put on weight after initiation of antipsychotic medication. Going forward, the development of a combined genetic/ phenotype risk score may help to target potential intervention strategies in those individuals deemed to be at risk of weight gain.

Given the close links between obesity/ overweight and the development of type 2 diabetes (T2D) in people treated with antipsychotic agents [14] with the associated increase in cardiovascular disease [15], a greater understanding of the factors linked

to weight change over time will benefit patients and inform clinicians.

**Strengths/limitations**

We have been able to access real-world data on people diagnoses with psychosis. We accept that the numbers are small and that we are limited to the coded diagnoses recorded in primary care. Also, the group studied live in one area of England and is of >95% Caucasian ethnicity. Only one in four of those with a diagnosis of psychosis underwent sufficient BMI measurements to enable any analysis of weight change over time, illustrating the continuing challenge in the UK and elsewhere to ensure that people being treated for psychosis undergo regular physical health checks including weight. Furthermore, there was a bias towards women rather than men having follow-up data available.

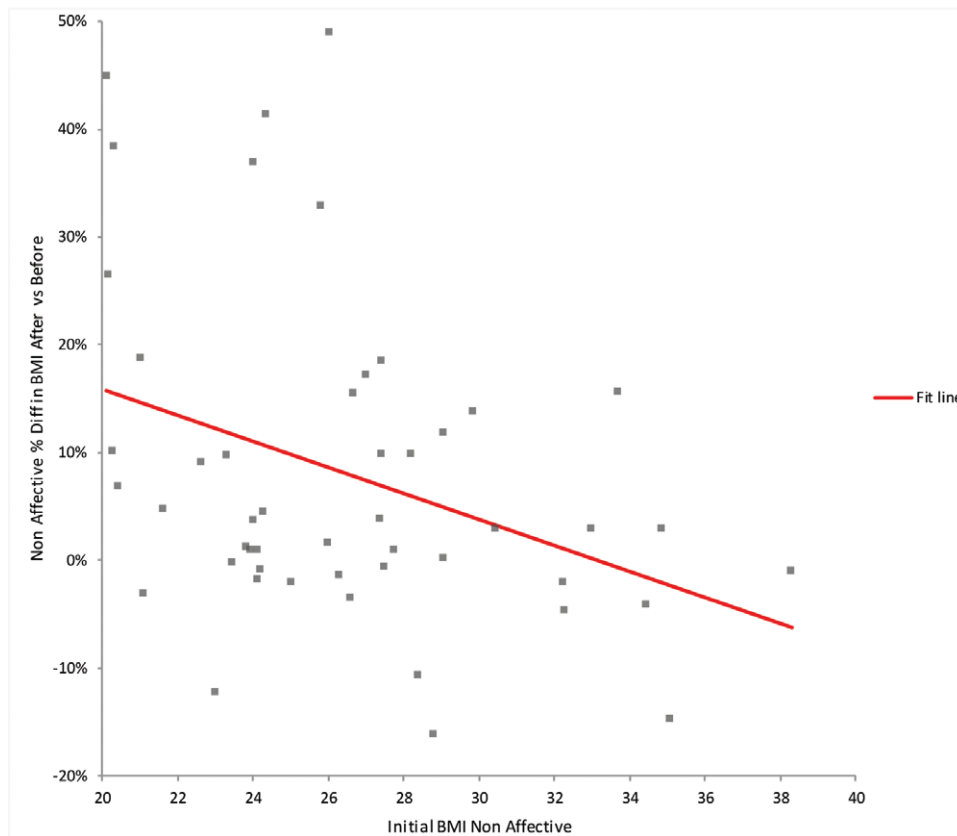
**Conclusion**

The difference in weight change distribution between individuals with affective versus nonaffective psychosis may relate to people with nonaffective psychosis having

**Table 2 Proportionate change in BMI by group over up to 10 years follow-up between affective psychosis and nonaffective psychosis individuals**

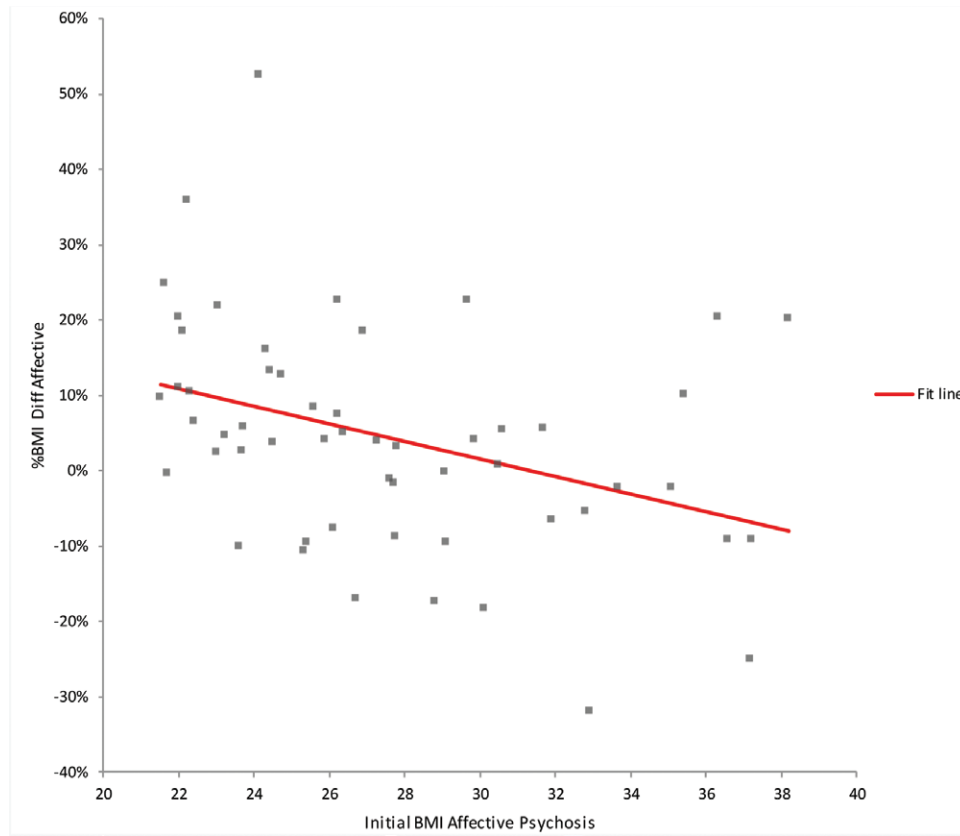
	≥30% BMI	≥20% BMI Inc	≥10% BMI
Affective psychosis	13%	15%	33%
Nonaffective psychosis	4%	16%	31%

**Fig. 3**



Linear regression of relation between baseline BMI and change in BMI for nonaffective psychosis.

Fig. 4



Linear regression of relation between baseline BMI and change in BMI for affective psychosis.

an underlying predisposition to weight gain related to constitutional factors. The phenotypic and genetic factors that may underly this remain to be defined.

### Acknowledgements

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### Conflicts of interest

There are no conflicts of interest.

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