

WEIGHTY MATTERS: THE ASSOCIATION BETWEEN MENTAL HEALTH, PREGNANCY AND OBESITY

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Those of you who have seen me talk know I often start off with an illustration that tries to put the obesity epidemic in context. Today I want to talk about the "It's a Small World Ride" at Disneyland. This ride is one of the original rides at Disney and, being built in 1963, it is relatively low tech by Disney standards. Basically, it involves sitting in a boat and floating down canals looking at Disney scenes. A lot has changed at Disneyland since this ride's inception, however, and approximately 5 years ago this ride had to be shut down because the size of North Americans has increased so much since 1963 that the boats were now starting to get stuck. Initially people were hired to stand on the sidelines with sticks and get the boats moving again once this happened, but the decision was eventually made to shutdown the ride in order to make the canals deeper and the boats wider. It has also been speculated that a number of rides built around the time the theme park opened are going to have to be revamped secondary to similar weight related safety concerns. And so while I can show you statistics about weight, I think the concept that we have outgrown Disneyland clearly illustrates what we mean when we talk about an obesity epidemic.

The growing problem of obesity is obviously quite complex and there is no one factor that can explain it. One important contributor to the obesity epidemic, however, is mental health. As we know there are bidirectional links between mental illness and weight¹⁻⁴ suffering from depression, for example, may experience weight gain secondary to sleep disruption or struggle with physical inactivity that can cause weight problems⁵, and conversely, with weight problems you may experience poor body image or physical health problems such as chronic pain that can

contribute to mood problems.⁵ We also know that if you have weight problems you are more likely to develop a psychiatric illness. This association is actually dose dependent in that as body mass index (BMI) increases, the likelihood of having a psychiatric diagnosis increases as well.^{6,7} Medications also play a pivotal role in the association between weight and mental illness. We often talk about patients being non-compliant, but given some of the side effects of medications I am often surprised by how many patients continue treatment⁸. This goes to speak to just how difficult having an untreated mental illness must be, that people are prepared to accept these side effects and adhere to pharmacological treatment. It is our responsibility, therefore, as clinicians to mitigate as much of the side effect burden as we can, and one of the biggest areas in which we can have impact managing side effects is in the area of weight gain. We know that the presence of a chronic mental illness decreases life expectancy and in fact, for major mental illnesses such as schizophrenia or bipolar disorder, this decrease is between 15 and 25 years.⁹ While a significant part of that decreased life expectancy is due to suicide, secondary causes such as cardiovascular disease and weight related medical comorbidities also play a large role.¹⁰ This is not necessarily an entirely pessimistic statement, however, as weight gain is fortunately an area where we can have some impact on. Part of the primary prevention of this problem requires education, and as clinicians we need to be aware of the different side effect profiles of the different medications in order to provide informed options to patients.

A strength of psychiatric practice today is that the ranges of available medications allow us to customize treatments to fit patients. This is

especially true with respect to side effect profile, and if we review the different medications currently available with respect to tolerability, it quickly becomes evident that when we refer to weight changes, the differences across medication classes can be significant.^{11,12} It is also important to be aware that while there has been a particular focus on the association between atypical antipsychotics and weight gain, we know now that it is not just that class of medications that are associated with weight changes, and, in fact, patients can experience a significant amount of weight change with antidepressants as well.¹³ This change is often more insidious, however, so while we do not see a dramatic 2 months, 15 lb weight gain, when monitored over time significant weight changes can occur.¹³ This is especially relevant given that weight gain is often a factor in medication noncompliance¹⁴, with discontinuation rates of up to 28% occurring by 4 weeks.¹⁵ Given that it often takes at minimum 4-6 weeks to experience clinical benefit from an antidepressant, what this means is that a lot of patients are discontinuing treatment before it has had time to work. For a long time sexual side effects and extrapyramidal symptoms such as dystonia and akathisia were linked to drug discontinuation but now weight gain is becoming a critical adherence factor.¹⁵

The established association between weight and mental illness has implications beyond direct cause and effect, and if we take a step back, we can begin to see patterns related to developmental origins of disease. We know that the in utero environment is important and there are things that happen to us in utero that have consequences throughout the rest of our lives. Maternal depression during pregnancy, for example, can impact a child's potential to develop a mental illness.¹⁶ We also know that exposure to psychiatric medication can directly impact placental function, and the changes that occur in the liver, the pancreas and the placenta in individuals taking these medications that may affect fetal growth.¹⁷ These medications also have potential to alter trophoblast function, one of the cells in the placenta.¹⁷ This association between exposures to both mental illness and mental illness treatments during pregnancy raises questions about the mitigating role of weight

change during pregnancy and its long term effects on offspring. Perhaps it is the indirect weight changes caused by medication that results in adverse outcomes, and not simply the direct effects of medication exposure. This is good news, as weight gain during pregnancy may be something we can impact.

The concept of acceptable weight gain, and especially the need to prevent excess weight gain during pregnancy, is something that has recently become a public health issue. As a result, in 2009, guidelines were produced by the Institution of Medicine in order to help provide education on healthy weight gain goals during this time period.¹⁷ These guidelines were an update of the guidelines initially published in 1990, but while those original guidelines focused on ensuring adequate weight gain happened during pregnancy¹⁸, they were published in 2009 because of concerns around the number of women going into pregnancy being significantly overweight and developing pregnancy complications such as gestational diabetes and emergency C-sections.¹⁹

This focus on weight gain during pregnancy is important not just because of the inherent risks to mom and baby that excess weight gain can confer, but because long-term health outcomes can be impacted as well. If we examine factors associated with weight gain as an adult, for example, maternal BMI and maternal pregnancy weight gain are one of the biggest predictors of both childhood and later life obesity.²⁰ Assaults during the in utero period can also result in a downstream increased risk of a variety of adult diseases.^{21,22} This is relevant for mental health as the increased risk is not just for diseases like hypertension, stroke and cardiovascular disease, and in utero exposures can actually increase risk of mental illness in the adult as well.²² Increased gestational weight gain is also related to health problems such as macrosomia, C-section, greater post partum weight retention, later obesity risk in the mom^{23,24} and an increased risk of having an obese child.²⁵ In addition, a more novel association stating to generate concern is that there are actually neurodevelopmental risks for offspring associated with weight gain in the mom as well.²⁶ This highlights an interesting concept because currently if you have a mother who has a psychiatric disorder, has put on a lot of weight

prior to getting pregnant because of medication use, who is now pregnant and has gained above the recommended guidelines for weight during pregnancy give birth to a child who had some type of neurodevelopmental outcome, that outcome is postulated to be a result of the direct effect of psychiatric medication. The link between obesity and neurodevelopmental problems challenges this explanation and provides another explanation, that the outcome is instead mediated by one of the side effects of the psychiatric medication, weight gain. It may be that some of the things that we are attributing to medication use in pregnancy may be able to be explained in part through weight changes in pregnancy. If we look at the obesity literature, this association is not new and there are numerous studies looking at individuals who are obese who actually have identifiable decreases in IQ as compared to normal weight individuals if you test them on sophisticated cognitive testing.²⁷

The association between weight and mental illness offers up an intriguing alternate hypothesis for some problematic perinatal health concerns that women with mental illness are at an increased risk for, and may explain a variety of perinatal outcomes. We know there are a number of adverse effects attributed to antidepressant use and one area of concern is fetal growth and preterm birth.²⁸ Interestingly, similar work from the obstetrical field, however, that has looked at preterm labour and low birth weight highlighted an association with obesity.¹⁹ As psychiatrists who work in reproductive health, we assume that if we see preterm birth it is related to psychiatric medications and focus very little on the role of obesity, while obstetricians working in the field look at the same outcome and focus on weight, not accounting for medication use. This highlights the importance of communication between different disciplines because it may be that many of these outcomes are mediated by a combination of factors and we need to view the area with a broader lens.

This type of interdisciplinary approach is important, especially since very little work has been done to examine the combined impact of these two areas as was clearly illustrated by a recent review paper we produced. We were interested in examining the outcomes of pregnancy in individuals taking psychiatric

medications when the studies controlled for weight gain and given there is an abundance of literature both examining the side effects of medications and pregnancy, and looking at weight gain associated with psychiatric medication use, we felt a review would be important to synthesize all the currently available data. We were extremely surprised, therefore, to find only two papers that met our search criteria.^{29,30} While we were still able to find a relationship using the available data, the paucity of information it illustrates that this is an area that we need research in.³¹

Talking to health practitioners about weight gain highlights another issue that occurs in the perinatal population that impacts this growing area of clinical concern. If you work in the area of reproductive mental health, there are so many issues that practitioners need to talk to patients about that often weight gain are simply not a priority. To try to assess the scope of this problem, we started to look at counseling rates in individuals presenting in standard obstetrics practices and it quickly became clear that even though the medicine guidelines that came out in 2009 told people how much weight that they were supposed to gain, not a lot of counseling around this area was happening.³² In fact, a significant number of women going into pregnancy planned to gain more than the recommended range because they thought that that was what was healthy and safe. These individuals were actually going in thinking they were supposed to gain 30, 40, or 50 lbs because no one was giving them the correct information and had they been aware of the guidelines they would have tried to adhere to them. Another intriguing factor regarding counseling for weight gain is highlighted by a study that looked at the predictors of physician counseling about weight that indicated that self-identified “overweight” physicians had almost 4 times as much difficulty counseling about weight as average weight physicians.³³ This type of bias and a feeling of unease in health practitioners impacts the type and amount of information transfer and can be extremely problematic as it can impede direct, clear communication. When we assessed rates of counseling around weight in an obstetrical setting, 95% of respondents stated they spoke about this issue with patients³⁴, but this

is incongruent with what patients reported receiving.³³

This is clearly a conversation we have to start being comfortable having and we have to start to become more aware of how this can impact individuals. A focus on healthy weight, and healthy weight gain, has the potential to impact both psychiatric and neonatal outcomes through direct and indirect mechanisms and needs to become part of routine care of patients.

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