THE UNIVERSITY OF ARIZONA HEALTH NETWORK

Department of Family and Community Medicine

Healthy Families in Healthy Communities

Use of Weight Positive Medications in Obese or Overweight Patients with Chronic Conditions

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Introduction

More than one-third of American adults are obese with an estimated annual medical cost of $147 billion.[1] Weight positive medications (WPMs) commonly prescribed for chronic conditions associated with obesity could exacerbate obesity and related comorbidities by causing weight gain. For example, gabapentin for chronic pain can lead to weight gain of 10% or more.[2] Patients on chronic beta-blocker or sulfonylurea therapy is associated with higher body weight than patients using alternate classes of medications. [3,4] Substitution of more weight negative or weight neutral drugs such as captopril and sitagliptin has been shown to have significant weight reductions patients with hypertension and/or diabetes. [4,5] Risperdone conveys a lower risk of metabolic syndrome than olanzapine in obese/overweight patients.[6] This project aims to: 1) examine the prevalence of obese or overweight patients who are also taking WPMs in a family practice, and 2) conduct a case study of the effect of WPMs vs. weight negative or weight neutral medications on patients' weight over 1 year.

Methods

We developed a list of 17 ICD 9 codes for obesity, overweight and weight gain, and a list of 33 common weight-related comorbidities (e.g. diabetes, hypertension, depression, low back pain, etc.). We then developed a table of medications of interest that are commonly used to treat these comorbidities (>42,000 unique products/NDC's), classified as either weight positive (medication is associated with weight gain) (Wpos), weight negative (Wneg) or weight neutral (Wneu). UAHN Family Care claims data (for past 1 year) was requested for patients assigned to either FCM Alvernon or South Campus clinics who met the following criteria: 1) diagnosis of obesity, overweight, or abnormal weight gain, 2) at least one of the codes for 33 weight-related comorbidities, and 3) pharmacy claim for at least one of medications of interest. Claims data was analyzed descriptively and plotted graphically to examine patterns of drug use (which drugs, numbers of fill, ratio of Wpos to Wneg/Wneu meds and fills) and comorbidities. A case study chart review was performed on top five and bottom five Alvernon patients (based on ratio of Wpos to Wneg/Wneu fills). The purpose of the chart review was to document changes in weight over past year and in the cases of patients on Wpos meds, identify whether the patient had previously been on a more Wneg/Wneu med or whether it might be reasonable to substitute a more Wneg or Wneu med.

Results

A total of 162 patients met the criteria of Obesity (*n=123*), Overweight (*n=14*), or Abnormal Weight Gain (*n=25*).

TABLE 1: Percentage of patients with chronic medical condition.

Percentage of Patients (%)	Diabetes (n=56)	HTN (n=66)	Depress. (n=13)	Pain* (n=122)
% of obese patients	42.3%	48.8%	8.1%	76.4%
% of overweight patients	35.7%	28.6%	28.6%	71.4%
% of abnormal weight gain patients	16.0%	24.0%	8.0%	56.0%
% on weight positive medicaitons	58.9%	47.0%	53.8%	39.3%
% on weight negative/neutral medications	60.7%	51.5%	61.5%	41.0%

* Chronic Pain includes "osteoarthritis", "low back pain", and "pain in lower leg, ankle, foot"

TABLE 2: Average number of fills per year.

Average # of Fills	Obese	Overweight	Weight gain
Weight Positive Medications	6.38	2.29	2.16
Weight Negative/Neutral Medications	3.48	1.14	3.36

	Weight *positive* medications (cause weight gain)	Weight *negative* medications (cause no gain* or weight loss)
DIABETES	Glipizide Glyburide Insulin Pioglitazone Rosiglitazone	Acarbose* Exanatide Glimepiride* Liraglutide Metformin Sitagliptan*
HYPERTENSION	Atenolol Clonidine Hydralazine Labetalol Prazosin Terazosin Valsartan	Amlodipine Captopril* Carvedilol* Enalapril* Furosemide Hydrochlorathiazide* Lisinopril Losartan* Metoprolol* Olmesartan
PSYCHIATRIC	Citalopram Clozapine Lithium MAO-I Mirtazapine Olanzapine Paroxetine Phenothiazines Risperdone TCA	Amphetamines Bupreporion Escitalopram* Fluoxetine Sertraline
CHRONIC PAIN	Amitriptyline Celecoxib Gabapentin Methadone Pregabalin	Acetaminophen* Baclofen* Carisoprodol* Cyclobenzaprine* Diclofenac* Fentanyl Hydromorphone Ibuprofen* Morphine Naproxen* Tramadol

FIGURE 1: Commonly prescribed weight positive, negative, and neutral* medications.

TABLE 3: Weight change over 1 year in patients with 5 highest and 5 lowest number of medication fills of weight positive or weight negative/neutral medications, respectively.

Patient #	Initial Weight (lbs.)	End Weight (lbs.)	Weight Change (lbs.)	Initial BMI	End BMI	BMI Change	# of Medication Fills - Weight Positive	# of Medication Fills - Weight Negative / Neutra	Comments
1	199.8	202.5	2.7	31.3	32.1	0.8	68	15	Most fills of insulin (Wpos) but also on metformin, lisinopril, and sertraline (Wneg)
2	242.3	274.6	32.3	45.8	51.9	6.1	57	10	Insulin for poorly controlled DM, also on lisinopril, metformin. No comparable alternative to amitriptyline (Wpos).
3	367.1	369.0	1.9	51.2	51.6	0.4	41	18	Insulin, metformin (DM). Lisinopril, amlodipine (HTN), Gabapentin, morphine (pain).
4	270.1	216.0	-54.1	42.3	34.9	-7.4	32	11	Lantus, metformin, lisinopril, gabapentin. No comorbidity to account for weight loss.
5	250.2	236.3	-13.9	50.5	49.4	-1.1	33	19	Insulin. Not on metformin due to CKD. Lisinopril, atenolol (HTN). Mirtazapine for anxiety. Tried on fluoxetine 7/13, was referred to psych, then refills for mirtazapine from our office without formal re-eval.
6	200.3	215.0	14.7	40.5	42.8	2.3	2	9	DM (metformin), HTN (lisinopril, metoprolol), LBP (naproxen, cyclobenzaprine).
7*	318.1	292.2	-25.9	56.3	52.5	-3.8	0	9	Received tramadol once for plantar fascia. Chronically on lithium (bipolar), tramadol (LBP).
8	213.7	207.3	-6.4	35.6	34.5	-1.1	0	9	Short term baclofen for relief of plantar fasciitis. Taking lisinopril, metformin. Advised to walk, decrease carbs.
9	218.8	173.7	-45.1	44.2	32.8	-11.4	23	34	Gabapentin and insulin for diabetes and neuropathy. Carvedilol for CHF. Tramadol for OA.
10*	300.0	219.9	-80.1	43.0	35.4	-7.6	0	21	Weight negative medications, including cyclobenzaprine, naproxen, tramadol, lisinopril.

* Data for patient #7 collected over 14 month span, and over 16 month span for patient #10; 12 months for all other patients

Conclusions

PCPs plays a crucial role in choosing appropriate medications for obese or overweight patients. Choosing Wneg or Wneu medications when allowable over Wpos medications can potentially have a significant impact on long-term weight. Only 1/5 patients with the most weight positive med fills category had Wpos medications when alternatives existed. Of the top five, all of whom had DM, 3 were on neuropathic drugs (which are all weight positive) and all were on at least 30 units of Lantus insulin for previous failure of oral hypoglycemics. In addition, despite taking Wpos medications, only 1 had significant weight gain (>10lbs), while 2 had relatively stable weight (<3lb change), and 2 actually lost weight, which may indicate that other lifestyle habits or clinical conditions may have a greater influence on net weight than medications alone. In contrast, 4/5 of the patients primarily on weight negative/neutral medications lost weight without formal interventions. However, the study was limited by low *n=162*, discrepancies in height measurements up to 2" for certain patients, as well as short interval for which weight was followed. In addition, only patients from one payer (UFC) was examined. It is possible that this represents a less diverse subset of patients. Future studies need to look at weight and BMI longitudinally over multiple years, while broadening to patients from a variety of insurance groups. Additionally, future research should focus on the magnitude of effects of specific medications on weight.

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