Bodyweight Change as an Adverse Effect of Drug Treatment
Mechanisms and Management

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Summary

A number of drugs are capable of changing bodyweight as an adverse effect of their therapeutic action. Bodyweight gain is more of a problem than bodyweight loss. As bodyweight gain during drug treatment for any kind of disease may be the reflection of improvement of the disease itself, we will try to separate these effects from those due to drug-induced alterations of the mechanisms regulating bodyweight. Bodyweight gain may jeopardise patient compliance to the prescribed regimen and it may pose health risks.

The body mass index (BMI) is determined by dividing bodyweight in kilograms by height in metres squared. A BMI of ≥27 kg/m² warrants therapeutic
action; nutritional counselling and programmed physical exercise can be used as a basis. In general, if basic therapeutic measures are unsuccessful at controlling bodyweight gain then a change of drug might help. Finally, an anorectic drug may serve to support dietary measures. However, safety and efficacy has been demonstrated for only a few anorectic drugs when used as an adjunct to caloric restriction in the treatment of drug-induced obesity.

Bodyweight is determined by complex mechanisms regulating energy balance. A number of neurotransmitter systems acting in several hypothalamic nuclei are pivotal to the regulation of body fat stores. Most drugs that are capable of changing bodyweight interfere with these neurotransmitter systems. The increment is dependent on the type and dose of the drug concerned.

Some antidepressant drugs induce bodyweight gain, which may amount to 20kg over several months of treatment. Monoamine oxidase inhibitors appear to cause less bodyweight change than tricyclic antidepressants. Selective serotonin (5-hydroxytryptamine; 5-HT) reuptake inhibitors cause bodyweight loss instead of bodyweight gain. Lithium may cause large increases in bodyweight. Generally speaking, the bodyweight change induced by antipsychotics is more often of clinical significance than the bodyweight change associated with the use of antidepressants. Again, the changes of bodyweight are dependent upon the type and dose of the antipsychotic drug involved. Although almost all antipsychotics induce bodyweight gain, molindone and loxapine appear to induce bodyweight loss. Anticonvulsants, especially valproic acid (sodium valproate) and carbamazepine, induce bodyweight gain in a considerable percentage of patients.

Treatment with corticosteroids is associated with dose-dependent bodyweight gain in many patients. Corticosteroid-induced obesity aggravates other corticosteroid-associated health risks. Insulin therapy in diabetic patients usually increases bodyweight. Finally, sulphonurea derivatives, antineoplastic agents used for the treatment of breast cancer and several drugs used in migraine prophylaxis may cause bodyweight gain as well.

A number of drugs are capable of changing bodyweight as a side effect of their therapeutic action. Generally speaking, bodyweight loss is not as big a problem as bodyweight gain, which may pose health problems or cause noncompliance to the treatment regimen. Fortunately, some of the agents implicated in bodyweight increase are sometimes prescribed for short term therapy, thereby limiting the problem of bodyweight gain. However, the great majority is used for the treatment of chronic diseases. This review will focus on the clinical relevance of drug-induced bodyweight changes, the mechanisms underlying these changes and ways in which such changes can be prevented.

Determining the potential of a drug to cause bodyweight gain can be difficult. Bodyweight loss is a symptom of many diseases and bodyweight gain during drug therapy may simply be the reflection of improvement in the disease itself. We will try to separate the bodyweight changes associated with improvement of the underlying disease and the bodyweight change that reflects a drug-induced alteration of the mechanisms regulating bodyweight. It is a prerequisite for a clear understanding of the way drugs bring about bodyweight changes to be aware of these mechanisms. Thus, we will briefly summarise some basic aspects of the physiology of bodyweight regulation, and then discuss bodyweight changes that occur as a side effect of the use of several categories of drugs, i.e. antidepressants, anti-