DEVELOPMENT OF THERAPEUTIC AGENTS: THE MATERNAL–FETAL PERSPECTIVE

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1 INTRODUCTION

The use of medicinal drugs in pregnancy is not uncommon. Women during pregnancy are affected by the same illnesses as the nonpregnant female population of comparable age and socioeconomical status, as well as from multiple conditions that can arise from, or are worsened by, pregnancy. For example, some pregnant women suffer from medical conditions that require ongoing or episodic drug treatment such as asthma, epilepsy, or hypertension. Many of these conditions may require drug therapy, where withdrawal or a decrease of treatment can lead to a worsening of the underlying condition and, in other cases, to long-term complications or even death of either the mother or her fetus. Moreover, pregnancy can induce conditions such as nausea and vomiting that may need to be treated pharmacologically. Despite the dearth of data on safety and efficacy of most medications during this period, it has been estimated that as much as 60–80% of pregnant women in developed countries receive medications and most of them on more than one occasion [1].

While the woman's well-being is at the heart of any medical treatment, placental transfer of drugs leading to potential toxicity to the fetus is a major concern in the pharmacological management of the pregnant patient. This poses a dilemma to the health provider, who needs to weigh risks and benefits of drug treatment for the pregnant patient, including evaluation of the uncertainties produced by the little available data on fetal safety for most drugs. Hence, when managing a pregnant patient with medication, the exposure of two individual patients, mother and fetus, should be considered independently, and the decision must be based on the risk–benefit assessment of both.

While the use of prescription drugs can sometimes increase the risk of teratogenicity, some medical conditions such as gestational diabetes, hyperthyroidism, or hypertension may require drug therapy in order to ensure optimal health of the mother and fetus. In this setting, a small risk of fetotoxicity (or even a moderate one in certain circumstances such as previously transplanted patients who become pregnant) is offset by the large maternal benefits provided by the drug treatment.

Of the thousands of available drugs, relatively few have been clearly shown to have the potential to adversely affect the fetus when used at the recommended doses. For example, the use of most traditional anticonvulsants, while necessary for the treatment of the mother, may cause structural defects as well as impaired neurocognitive development in a small proportion of exposed babies [2, 3]. Thus, a potential maternal–fetal conflict brings to light the need to identify drugs that

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