Treatment of preterm births with pregnancy hormone, human chorionic gonadotropin

Birth of infants between the 20th to 37th completed gestational weeks is considered preterm. They account for more infant deaths than from any other single cause. The incidence is about 9% in the U.S. and it is increasing. The incidence in third-world countries is even higher, mainly due to the lack of prenatal care, especially in rural areas. There are many risk factors such as, race, ethnicity, socioeconomics, medical and pregnancy conditions, behavioral characteristic, genetics, number of previous preterm births and how early they occurred. Tests to identify the women at risk have not always been successful. Prematurely born infants face numerous life threatening medical problems. They require intensive medical care for weeks in hospitals. The infants that survive these initial challenges are at a greater risk for early death and lifelong neurologic and cognitive difficulties. Preterm births costs the U.S. economy more than $26 billion annually. This cost does not include many more millions of health care dollars required for taking care of short and long term health problems and developmental disabilities during the life time of infants. Emotional problems, guilt feeling and economic setbacks are common among the families of affected infants.

Many drugs are available for the treatment of preterm births. Among them is the popular first line therapy with magnesium sulfate ($MgSO_4$). Most of these drugs, including $MgSO_4$, have side effects in the fetus and the mother. Yet they are used for short term to delay preterm births for at least 24-48 hours, so that obstetricians can treat the mothers with corticosteroids to promote fetal lung maturity. The infants with relatively mature lungs have better survival chances. Therapy with natural or synthetic progestin's can also work, but they are only effective in women who have previous history of preterm births. In addition, the use of synthetic progestins can be quite expensive.

The idea that pregnancy hormone, human chorionic gonadotropin (hCG), can be useful for the treatment of preterm births came from the scientific studies which showed that hCG maintains pregnancy, in part, by inhibiting uterine activity. The inhibition allows pregnancy continuation. hCG works in delaying preterm births in an animal model. Five different clinical studies, conducted on women from different ethnic backgrounds and under vastly different conditions, have shown that hCG therapy works not only in women with active labor and but also in those at high risk, due to previous history of preterm births. These studies have also shown that hCG therapy had no side effects in the fetus or in the mother and it is preferred compared to treatment with $MgSO_4$ and vaginal progesterone tablets. However, these studies lack the vigor of large-scale multicenter, randomized double-blind and placebo-controlled clinical trials, such as those that have been done for progestins. The authors calls for such trials, sponsored by private and/or governmental funding agencies. There is no reason to wait any longer.

hCG is a physiological hormone with tolerable side effects, if any. It is cheap and can even be made cheaper. The hCG administration technologies can be reengineered to reduce the dose,

treatment frequency, mode of administration, etc. In addition, it may be possible to develop safe self-administration technologies to give women, who live in rural areas of third world countries, the time to seek the specialists help in a nearby medical center.

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Publication

Why are We Waiting to Start Large Scale Clinical Testing of Human Chorionic Gonadotropin for the Treatment of Preterm Births?
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Reprod Sci. 2015 Dec 20