

Clinical Research Project: Priapism in Boys and Young Men: Incidence and Prevalence

The primary goal of this study is a comprehensive investigation of priapism in boys and young men with sickle cell disease. It is an initial step towards more effective management of this common, serious complication of sickle cell disease, and a reduction of impotence as a sequela of priapism. The **specific aims** are to define the incidence of priapism in relationship to the physical and hormonal developmental stages of puberty and early maturity, to explore the relationship between priapism and psychological adjustment, and to rigorously compare the use of pseudoephedrine to placebo, and leuprolide to exchange transfusion for the prevention of priapism. The study is being conducted in two stages.

Phase 1, is an observational phase open to all boys and young men with sickle hemoglobinopathies from age 7 –29 years. They will keep daily records of the occurrence of priapism, and will be admitted every 6 months for an intensive evaluation of physical growth, genital pubertal stage, body composition, bone age, gonadotropins, testosterone, insulin-like growth factor and nocturnal penile tumescence. Also during the admissions they will have several psychological assessments. The data from the first phase will be used to determine if there is an association between pubertal stage and/or gonadotropin and testosterone concentrations and the occurrence of priapism. The data will also determine if there is a relationship between priapism and psychological adjustment.

Phase 2 is a two-stage preventive treatment trial for those who have qualifying episodes of priapism. The initial trial will be a randomized, double-blinded trial of pseudoephedrine vs placebo. Crossover will be permitted for those who continue to have priapism. Those who continue to have priapism during the pseudoephedrine vs. placebo trial will go on to the leuprolide vs exchange transfusion trial. This will be randomized but not blinded. Leuprolide sufficient to suppress testosterone secretion will be given monthly for 6 months and compared to exchange transfusion monthly with a goal of maintaining hemoglobin S at less than 30% of total hemoglobin. Crossover will be permitted for those who continue to have priapism on either arm of the leuprolide vs transfusion phase. During the preventive treatment trial the participants will continue to keep daily journals of priapism occurrence and will have admissions every 3 months for the same physical, hormonal and psychological assessments as in the observational phase. The outcome measures on the prevention trial will be the occurrence of priapism, duration of priapism and the interval between episodes of priapism. In addition, physical growth, secondary sexual development, body composition and psychological adjustment will be compared between the treatment arms.