Introduction

OPKO Biologics developing bio better long acting versions of existing therapeutic proteins utilizing a technology called CTP.

CTP – A Natural Peptide Created During Evolution to Enhance Longevity of the hGH Hormone

Any Short-Living Protein + CTP = Long-Living Protein

The technology involves fusion of the C terminus peptide of HGH to one or both ends of the target protein. The technology was clinically validated and proven as a safe and efficient way for increasing the half-life of several therapeutic proteins while maintaining their biological activity. MOD-4023 (HGH-CTP) is a long acting HGH with the following competitive advantages:

- Non Viscous, high concentration formulation
- Consists of ~75% native HGH content
- HGH-CTP is injected by pen device with 30 - 31G needle

Study Outline

A one-year, randomized, comparator-controlled Phase 2 study that included 53 pre-pubertal GHD children with GHD was conducted. The patients received once-weekly SC injections of MOD4023 (0.25, 0.48, or 0.66 mg/kg/week), or daily HGH (34 μg/kg/day) as control. Forty-six patients were rolled over to an open-label extension study (OLE) and continued to be administered with the same MOD-4023 dosages on a weekly basis, in order to assess longer-term safety and efficacy. Height velocity (HV) in 45 patients during the second year of MOD-4023 treatment was monitored and compared to historical controls (Ranke et al., 2010). IGF-1 and IGFBP-3 levels were monitored as well.

PK / PD

MOD-4023 Mean Serum Concentrations Following 24m of once-weekly administration

IGF1-SDS Profile Following 24m of MOD-4023 Administration

IGF1-BP3 Profile Following 24m of MOD-4023 Administration

Efficacy

Mean Annualized HV for subjects completed 24m of Once-Weekly MOD4023 treatment

Delta Height SDS for subjects completed 24m of Once-Weekly MOD4023 treatment

Conclusions

- Weekly administration of MOD-4023 maintained a steady-state levels with no apparent significant increase in plasma level, which was measured on Day 4 post dosing over the 24m of study periods.
- MOD-4023 provided an adequate IGF1-SDS response, well within the normal range, reaching an optimal average value of 0 SDS, and most importantly, not exceeding +2 SDS on Day 4 post-dosing up to 24 months.
- IGFBP-3 also increased in a dose-dependent manner upon MOD-4023 administration, reaching steady-state values during the first and second year of the study.
- Efficacy data confirmed that single weekly administration of MOD-4023 for the treatment of pediatric GHD patients during 24m led to promising 2nd year growth, also when compared to pre-published GH clinical study (Ranke et al., 2010).
- To sum, the presented data further affirms that once-weekly injection of MOD4023 could replace daily injections of HGH in GHD children.

The PK-PD, efficacy and safety data support the initiation of a Phase 3 study in GHD pediatric population using a single weekly injection of MOD-4023.