PRESS RELEASE
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PMDD Phase IIb study, including post-hoc analysis showing 'significant treatment effect', published in Journal of Psychoneuroendocrinology

(Stockholm, 28 September 2021.) **The publication of Asarina Pharma's phase IIb study, including a *post hoc* analysis into Sepranolone for PMDD (Premenstrual dysphoric disorder), demonstrates that Sepranolone in a 10 mg dose did have a significant treatment effect compared with placebo, when examined in an extended 9-day analysis of symptom reduction. Senior PMDD Key Opinion Leaders who co-authored the publication include Dr Nick Panay (Imperial College London), Prof. Shaughn O'Brien (Royal Stoke University Hospital, UK), Prof. C. Neill Epperson (Dept. Psychiatry, University of Colorado), Prof Marie Bixo (Umeå University, Sweden) and Dr Angelica Lindén Hirschberg, Karolinska University Hospital, Stockholm, Sweden – together with Asarina Pharma CSO Prof Torbjörn Bäckström (Umeå University, Sweden).**

Topline results for Asarina Pharma's phase IIb study in Sepranolone for PMDD, released in April 2020, found that Sepranolone failed to meet its primary or secondary clinical endpoints in its 5-day targeted treatment period of the five worst premenstrual days, due to an unexpectedly high placebo effect. A *post hoc* analysis was undertaken to investigate the treatment effect during an extended 9 premenstrual days in the third treatment cycle (it has previously been shown that 9 premenstrual days may be more representative for comparison of PMDD symptom periods than the 5 worst premenstrual days). Data from this analysis were presented on February 12, 2021, and have now been published in the Journal of Psychoneuroendocrinology, titled *A randomized, double-blind study on efficacy and safety of sepranolone in premenstrual dysphoric disorder* (Bäckström et al.).

Key findings:

- A significantly larger number of individuals experienced no or minimal symptoms (Sum21 < 42 points) with the 10 mg Sepranolone treatment compared to placebo.
- The Sepranolone 10 mg was significantly better than placebo (p = 0.008), and similar significant treatment effects were found for the impairment and distress scores.
- "These results indicate that there is an attenuating effect by Sepranolone on symptoms, impairment, and distress in women with PMDD especially by the 10 mg dosage"

Asarina Pharma CEO Peter Nordkild: "As I commented when we first communicated the results in our 2020 Annual Report, these findings would be valuable to any larger pharma partner wishing to pursue future PMDD studies. We have been very clear that we do not intend to continue clinical development of Sepranolone for PMDD by ourselves - as a study needed to further corroborate these findings would realistically involve at least six months of therapy and likely several hundred patients – which is clearly beyond our current capabilities. Nevertheless, these data are exciting, and represent one of the most important and promising bodies of evidence to date when it comes to a pharmaceutical treatment for PMDD. They further clearly point towards allopregnanolone's role as a key factor in triggering highly disruptive, mood-altering symptoms, including our current focus areas of Tourette and OCD – and confirm our confidence in Sepranolone as an important and effective modulator of allopregnanolone."

Read the full paper HERE.

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About Asarina Pharma

We are a Swedish biotech company developing Sepranolone for allopregnanolone-related stress, and compulsivity-driven disorders. Our product pipeline is built on over 40 years of research into allopregnanolone-related neurological disorders. With our new family of GAMSA compounds ($GABA_A$ Modulating Steroid Antagonists) we aim to deliver a new generation of efficacious and safe drugs for still widely untreated neuroendocrinological conditions.

About PMDD

Premenstrual dysphoric disorder (PMDD) is a severe neuroendocrinological condition affecting 4-8 percent of women of fertile age worldwide. The condition is often highly socially impairing with cyclical, often personality-altering symptoms that build up in the luteal phase (the two weeks before a period), peak in the week directly before menstruation, and then recede quickly when the period starts. Emotional symptoms include extreme mood changes, severe irritability and/or anger, depression, anxiety and feelings of hopelessness and low self-worth. In May 2019 PMDD received its own classification code, GA34.41, as a gynecological disease in the WHO International Classification of Diseases, ICD-11.

About Asarina Pharma's phase IIb PMDD study

The phase IIb study was a randomized, double-blind, placebo-controlled study carried out in 14 study centers in Sweden, the UK, Poland and Germany. 206 patients, average age 33 years, were randomized after completing the screening. 547 menstrual cycles were evaluated, the average menstrual cycle length in baseline cycles was 28.1 days with 90 percent of cycles having less than ±2 days cycle length difference. Patients administered their own 0.4 mL injections using a prefilled single-use syringe. Two doses were administered, 10 and 16 mg per dose. Treatment began 14 days prior to estimated start of next menstruation, running every second day during the luteal phase up until the beginning of menstruation, with a maximum 7 doses per cycle. Patients filled in a daily rating of severity of problems, DRSP, of 11 PMDD symptoms. The primary endpoint of the study was calculated from the late luteal phase total symptom score (LmaxSum21), as the difference between the average scores of two baseline cycles and the average score in the treatment cycles. The reduction in these scores was compared between actively treated and placebo treated patients. The average baseline score was 85 points, corresponding to patients having moderate to severe PMDD symptoms. Study treatment reduced the effect score by 27.9 points in the placebo group, compared to 30.3 in the active Sepranolone group, resulting in minimal to mild PMDD symptoms during treatment.