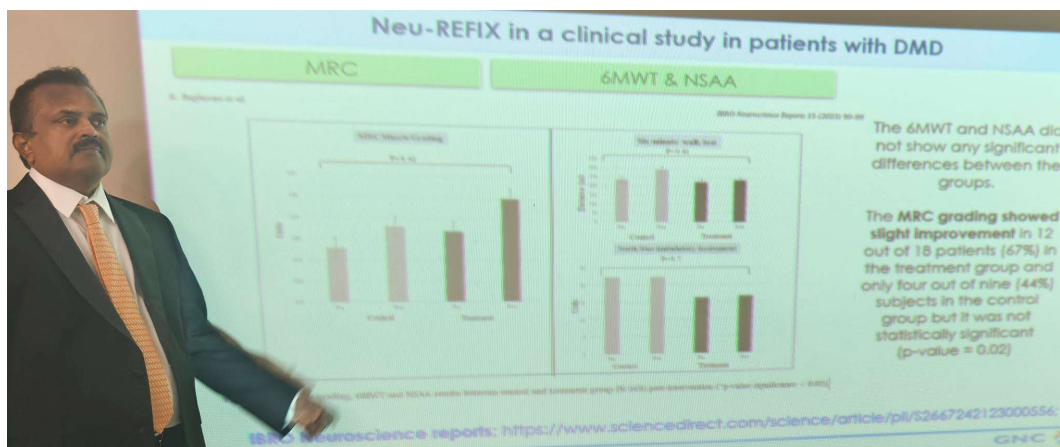


Neu-REFIX beta glucans help overcome muscle fatigue in Duchenne muscular dystrophy mdx mice; presented in MDA conference 2024, USA.

Yamanashi Prefecture Innovation Research Grant, supports the research.

08, March 2024., Muscle fatigue, that increases gradually with disease progress in Duchenne Muscular Dystrophy was found manageable in mdx mice with Neu REFIX beta glucan in a pre-clinical study conducted jointly by scientists from India and Japan, which was presented in the MDA Clinical and Scientific Conference held in Florida, USA (1). The mdx mice that were fed Neu REFIX beta 1,3-1,6 glucans orally, had a significantly lower muscle fatigue on days 41 and 45 compared to the control group which didn't consume Neu-REFIX. This study undertaken jointly with the team of Molecular therapy department of National Center for Neurology and Psychiatry (NCNP), Tokyo, Japan headed by Dr Yoshitsugu Aoki, is considered value adding to the clinical study outcome (2) amounting to the delaying of the disease progress opined Dr.K.Raghavan, Paediatrician, Jaicare Hospital, Madurai, India.



Dr. Raghavan during a presentation on the clinical study results in DMD

DMD being a rare genetic disease in which a protein essential for smooth functioning of the muscles called dystrophin is deficient, leading to damage or degeneration of the muscles. The damaged muscle debris need to be cleared, which is an essential step for their replacement by muscle resident satellite stem cells, that contribute to regeneration. The continuous cycle of degeneration and regeneration makes the environment highly complex in terms of diverse array of macrophages, each one

playing specific role from managing the pathology to rebuilding the tissues. In the skeletal muscles of mdx mice, an immunohistochemical evaluation revealed an increase of CD68 macrophages in the Neu-REFIX fed group of mice, which according to the researchers symbolizes a better clearing of the damaged muscles, that needs further validation in addition to the earlier proven biomarkers of regeneration viz Myosin heavy chain 3 (MYH3) and CD44 (3). The evaluations were undertaken in collaboration with Prof Shuji Sakamoto of Kochi University, Japan which was also presented in the MDA 2024 conference (4). These steps were in follow-up of the earlier pre-clinical studies reported (5) and further research is in progress in collaboration with Prof. Nobunao Ikewaki of Kyushu University of Health and Welfare, Nobeoka, Japan.

Based on such encouraging pre-clinical research data, the team led by Dr Raghavan has completed the second clinical study for a longer, six months duration (6) in which ambulatory patients showed modest improvements in 6MWT (Six-minute walking test; 6MWT) and the non-ambulatory patients showed modest improvements in MRC. Though there is no statistical significance between the improvements in strength between the groups in the clinical study, the data strongly indicates to an arresting or halting of the disease progress in those who consumed Neu REFIX along with the standard of care medications, he commented. Historically in DMD, gradually the muscle fatigue will increase, strength will decline leading to muscle dysfunction and bring down the distance the patients can walk in a specific duration of time in those who are ambulatory or bring down the strength of the muscles as evaluated by physical examination in those who are non-ambulatory, dependent on a wheelchair. Signs of such halting of the disease progress of DMD with Neu REFIX, Dr. Raghavan said has made him recommend it to his patients diagnosed with DMD as a routine adjuvant along with the standard of care medications as the Neu REFIX is allergen-free without any side effects and is available as a food supplement, while recommending longer duration multi centric studies to make it validated as a drug.

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1. <https://www.mdaconference.org/abstract-library/decline-in-muscle-fatigue-score-of-mdx-mice-after-oral-administration-of-neu-refix-beta-13-16-glucans-in-a-short-duration-study-of-45-days/>

2. <https://www.sciencedirect.com/science/article/pii/S2667242123000556>
3. <https://www.mdaconference.org/abstract-library/enhanced-muscle-regeneration-in-mdx-duchenne-muscular-dystrophy-mice-proven-by-cd44-myh3-on-consumption-of-a-pullulans-produced-neu-refix-s-glucan/>
4. <https://www.mdaconference.org/abstract-library/evaluation-of-infiltrating-cd68-macrophages-and-myofiber-cross-sectional-area-in-the-skeletal-muscle-of-mdx-mice-after-oral-administration-of-neu-refi/>
5. <https://www.nature.com/articles/s41598-023-44330-0>
6. <https://doi.org/10.1101/2023.04.29.23289260>