Nusinersen: Adis Evaluation

Clinical Considerations

- Modifies *survival motor neuron 2* (*SMN2*) pre-messenger RNA splicing, thereby increasing full-length survival motor neuron (SMN) protein levels
- Improves motor function in presymptomatic and symptomatic patients, and event-free survival and overall survival in symptomatic patients with infantile-onset disease
- Improvements seen in all age groups, with greater benefits in those receiving earlier treatment
- Most reported adverse events were related to the disease itself or the lumbar puncture procedure

Plain Language Summary

Background and rationale

- 5q spinal muscular atrophy (SMA) is a rare disease most commonly caused by a defect in the *SMN1* gene, which in a healthy individual produces a protein (SMN protein) critical to maintaining the nerves that control muscles
- Individuals with 5q SMA do not produce this protein in sufficient levels, resulting in muscle weakness and wasting (including the muscles involved in general movement, breathing and swallowing), so increasing the amount of SMN protein by modifying a nearly identical, but low functioning, gene (*SMN2*) is one way to treat the disease
- Nusinersen (Spinraza®) is a treatment that targets *SMN2*. It is administered via lumbar puncture and is approved for use in presymptomatic and symptomatic individuals with 5q SMA

Clinical findings

- In both presymptomatic and symptomatic patients, nusinersen increases the amount of SMN protein necessary for the muscles and nerves to work normally, , improving motor function. This benefit persists over the longer-term (up to ≈ 6 years), and is well tolerated

Conclusion

Nusinersen continues to be a valuable treatment option among a broad range of 5q SMA patients