BACKGROUND

Hepatorenal syndrome (HRS), a special form of acute kidney failure, is a crucial, life-threatening complication of chronic liver disease and is associated with a very poor prognosis.1

- Estimated HRS incidence in the United States (US) is about 4,500 cases per year2,3
- HRS is often unresponsive, median survival time is less than 3 months4

- From 2005 to 2011, annual costs for HRS increased by $11,942 to $23,1905

- HRS economic burden is primarily attributed to costly hospitalizations; key cost drivers in HRS from a hospital perspective include mortality, length of stay, hospital readmission, and dialysis related to severe acute renal failure6

- TERLIVAZ® (terlipressin) is the first and only Food and Drug Administration (FDA)-approved treatment for HRS, but are not FDA-approved treatments for patients with HRS;15 therefore, the safety or efficacy of unapproved treatments, including M&O + albumin and norepinephrine + albumin, has not been shown in US patients7

- TERSAP® (terlipressin) is the first and only Food and Drug Administration (FDA)-approved treatment for HRS, but are not FDA-approved treatments for patients with HRS;15 therefore, the safety or efficacy of unapproved treatments, including M&O + albumin and norepinephrine + albumin, has not been shown in US patients7

- Prior to the approval of terlipressin, midodrine and octreotide (M&O) or norepinephrine were used for HRS

- The relationship between HRS reversal and likelihood for dialysis is based on analysis of pooled data of international guidelines14

- Estimated HRS incidence in the United States (US) is about 44,000 cases per year;5-7 HRS was present in 3.2% of hospitalized patients with chronic liver disease8

- Upon treatment, patients can experience HRS reversal (complete response; defined as a decrease in serum creatinine by at least 30% within 3 days) after receiving terlipressin

- If HRS is left untreated, median survival time is less than 3 months4

- The effect of HRS reversal on ICU-related costs, generated based on the CONFIRM trial may be different from a hospital/institution’s experience

- Due to a short time horizon, other mid-and long-term benefits of HRS reversal (reduced need for kidney transplantation and better outcomes post-liver transplantation) are not captured

METHODS

Model Inputs

- Treatment efficacy
  - Efficacy, safety, and treatment duration were obtained from several published head-to-head randomised international trials
  - Response rate for terlipressin + albumin versus M&O + albumin was estimated based on a randomized controlled trial in patients with HRS
  - Treatment-related costs for terlipressin + albumin (based on International Club of Ascites 2015 criteria) were obtained from the published literature (estimated based on pooled analysis of four trials including patients with HRS based on International Club of Ascites 2015 criteria)19

- Healthcare resource utilization
  - Terlipressin + albumin was assumed to be administered in the non-ICU setting
  - Healthcare costs were obtained based on the health system cost drivers that are usually present

- Cost per response
  - Terlipressin + albumin resulted in higher ICU- and dialysis-related costs

- Treatment-related costs
  - Total treatment cost for terlipressin + albumin was $25,514 higher than M&O + albumin ($47,461 versus $21,947) (Figure 2)
  - M&O + albumin resulted in higher ICU- and dialysis-related costs

- Cost per response of terlipressin + albumin was lower than M&O + albumin ($65,315 versus $467,794)

- Dialysis-related costs were higher with M&O + albumin ($22,267) than with terlipressin + albumin ($8,266)

- Two patients need to be treated with terlipressin + albumin to achieve one HRS reversal versus 21 patients who need to be treated with M&O + albumin

RESULTS

- Total treatment cost for terlipressin + albumin was $25,514 higher than M&O + albumin ($47,461 versus $21,947) (Figure 2)

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CONCLUSIONS

- Total treatment cost for M&O + albumin was lower than terlipressin + albumin ($85,315 versus $467,794)

- Norepinephrine + albumin resulted in higher ICU- and dialysis-related costs ($22,267) than with terlipressin + albumin ($8,266)

- Two patients need to be treated with terlipressin + albumin to achieve one HRS reversal versus 21 patients who need to be treated with M&O + albumin

OBJECTIVE

To estimate the cost per response of terlipressin + albumin versus other unapproved treatments, including M&O + albumin and nonrearpine + albumin, from the US hospital perspective

LIMITATIONS

- Hospitalization-related cost data are sourced from publicly published randomized controlled trials, which may not generalize to the adult HRS population in the US

- Further, verifs HRS reversal, primary endpoint of the CONFIRM trial, was not used in this analysis

- The estimated cost for non-ICU-related cost data was based on the IMPACT-TERLIVAZ study as well as national and international guidelines and published literature

- Dialysis-related costs were higher with M&O + albumin ($22,267) than with terlipressin + albumin ($8,266)

- Two patients need to be treated with terlipressin + albumin to achieve one HRS reversal versus 21 patients who need to be treated with M&O + albumin

REFERENCES

- Mallinckrodt Pharmaceuticals; Jas Bindra and Ishveen Chopra and were paid research consultants for the study


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