EE328

Healthcare Costs in Patients with Hepatic Encephalopathy Receiving Rifaximin-α Treatment in the IMPRESS II Study

Authors: Buxton A[1], Morgan C Ll[1], Murphy D[2], Aspinall R[3].

Affiliations: [1]Human Data Sciences, Cardiff, UK, [2]Norgine Ltd, Harefield, UK, [3]Portsmouth Hospitals University NHS Trust, UK.

Introduction

- Hepatic encephalopathy (HE), a complication of liver cirrhosis, is associated with poor quality of life and increased mortality. [1, 2]
- Rifaximin-α is an oral antibiotic that has been shown in clinical trials to reduce overt episodes of HE. [3]
- In real-world practice, the IMPRESS study demonstrated a reduction in healthcare resource utilisation (HRU) for patients with HE when treated with rifaximin-α, as compared to the standard of care. [4] The IMPRESS II study extended this analysis by providing HRU data over a longer time horizon, offering insights into the sustainability of these reductions in HRU. [5]
- This analysis builds on these findings by quantifying the associated healthcare resource costs reported in IMPRESS II.

Methods

- The study population was derived from IMPRESS II, a UK-based, multicentre, retrospective observational study focusing on long-term HRU in patients with HE.
- A total of 138 patients were followed for up to 5 years after initiating rifaximin-α treatment, across nine National Health Service hospitals.
- Data collected included inpatient admissions, outpatient appointments, emergency department (ED) attendances, and intensive care unit (ICU) admissions.
- Due to the absence of Healthcare Resoure Groups (HRGs) in the IMPRESS II data, weighted average costs from a prior study that analysed HRU in a cohort of HE patients were applied. [6] These costs were based on HRGs that were mapped to the National Tariff 2019-2020 and adjusted for inflation.
- Costs were categorised based on whether they were liver-related and the type of admission.

Results

- Total healthcare resource costs (ED visits, inpatient admissions, ICU admissions, and outpatient visits) for HE patients 1-5 years post-rifaximin-α treatment initiation were primarily driven by inpatient admissions.
- For all-cause contacts, costs were £1,085,305 for inpatient admissions, £153,009 for outpatient appointments, £35,997 for ED visits, and £25,602 for ICU admissions. [Table 1]
- Respective costs for liver-related contacts were £849,972, £91,353, £19,508, and £11,379. [Table 1]

Table 1. Overall healthcare resource use and costs 1–2 and 2–5 years post-rifaximin-α initiation*

	Resource timeline			Costs (£)			
	1-2 years	2-5 years	Total	1-2 years	2-5 years	Mean	Total
Total liver-related admissions/visits recorded							
ED visits	44	40	84	10,218	9,289	232	19,508
Inpatient admissions	76	115	191	391,075	458,897	4,450	849,972
ICU admissions	3	0	3	11,379	-	3,793	11,379
Outpatient visits	265	444	709	34,145	57,208	129	91,353
Total all-cause admissions/visits recorded							
ED visits	68	87	155	15,792	20,205	232	35,997
Inpatient admissions	131	176	307	500,467	584,838	3,535	1,085,305
ICU admissions	3	2	5	11,379	14,223	5,120	25,602
Outpatient visits	381	742	1,123	51,420	101,589	136	153,009

* Erratum in previously published paper [5] have been corrected here.

- The median cost per patient-year for resource use in the 1-2 years post-rifaximin-α initiation was £309 for liver-related outpatient visits and £387 for all-cause outpatient visits. For ED visits, inpatient admissions, and ICU admissions, the median cost was £0 for both liver-related and all-cause admissions. [Table 2]
- In the 2-5 years post-initiation, the median cost per patient-year remained stable at £279 for liver-related outpatient visits and £400 for all-cause outpatient visits. Respective costs for inpatients were £0 and £1,347. For ICU admissions and ED visits, the median cost per patient-year was £0 for both liver-related and all-cause admissions. [Table 2]

Table 2. Healthcare Resource Use and Costs Per-patient 1–2 and 2–5 years post-rifaximin initiation*

	Resource timeline		Costs (£)	
	1-2 years	2-5 years	1-2 years	2-5 years
Liver-related resource use per patient per year - median (range)				
	(n = 98)[a]	(n = 78)[b]	(n = 98)[a]	(n = 78)[b]
ED visits	0 (0, 11.4)	0 (0, 17.8)	0 (0, 2,649)	0 (0, 4,036)
Inpatient admissions	0 (0, 10.0)	0 (0, 17.8)	0 (0, 43,251)	0 (0, 81,436)
ICU admissions	0 (0, 1.0)	0 (0, 0)	0 (0, 7,112)	0 (0, 0)
Outpatient visits	2.4 (0, 13.3)	2.2 (0, 27.4)	309 (0, 1,706)	279 (0, 3,527)
All-cause resource use per patient per year - median (range)				
ED visits	0 (0, 12.2)	0 (0, 17.8)	0 (0, 2,649)	0 (0, 4,036)
Inpatient admissions	0 (0, 11.6)	0.3 (0, 17.8)	0 (0, 43,251)	1,347 (0, 81,436)
ICU admissions	0 (0, 1.0)	0 (0, 0.6)	0 (0, 7,112)	0 (0, 3,377)
Outpatient visits	3.0 (0, 22.9)	3.1 (0, 28.4)	387 (0, 3,397)	400 (0, 3,678)
Emergency department – discharge/transfer destination after admission (liver-related admissions)				
	(n, %, n = 44)	(n, %, n = 40)	(n = 44)	(n = 40)
Inpatient admission (%)	34 (77.3)	38 (95.0)	7,896	8,824
ICU admission (%)	1 (2.3)	0 (0.0)	232	-
Discharged home (%)	9 (20.4)	2 (5.0)	2,090	465
Emergency department – discharge/transfer destination after admission (all-cause admissions)				
	(n, %, n = 68)	(n, %, n = 87)	(n = 68)	(n = 87)
Inpatient admission (%)	49 (72.1)	57 (65.5)	11,380	13,237
ICU admission (%)	1 (1.5)	1 (1.2)	232	232
Discharged home (%)	18 (26.4)	29 (33.3)	4,180	6,735
Inpatient admission – discharge/transfer destination (liver-related admissions)				
	(n, %, n = 76)	(n, %, n = 115)	(n = 76)	(n = 115)
Discharged home (%)	72 (94.7)	108 (93.9)	372,334	422,124
ICU admission (%)	1 (1.3)	0 (0.0)	4,685	-
Patient died (%)	3 (4.0)	7 (6.1)	14,056	36,773
Inpatient admission – discharge/transfer destination (all-cause admissions)				
	(n, %, n = 131)	(n, %, n = 176)	(n = 131)	(n = 176)
Discharged home (%)	122 (93.1)	167 (94.9)	469,868	543,693
ICU admission (%)	2 (1.6)	1 (0.6)	7,798	2,186
Patient died (%)	7 (5.3)	8 (4.5)	22,800	38,959

[a] Number of patients surviving to year 1
[b] Number of patients surviving to year 2
* Erratum in previously published paper [5] have been corrected here.

Conclusion

- Taken together with previous observations of reduced HRU post-rifaximin-α initiation, as compared to the standard of care, the observed low rates of HRU support the rationale that rifaximin-α provides a long-term economic benefit.

References

[1] M. Groeneweg, et. al , “Subclinical hepatic encephalopathy impairs daily functioning,” Hepatology, vol. 28, no. 1, pp. 45-49, 2003. [2] M. Romero-Gómez, et. al, “Hepatic encephalopathy in patients with acute decompensation of cirrhosis and acute-on-chronic liver failure,” Journal of Hepatology, vol. 62, no. 2, pp. 437-447, 2014. [3] N. M. Bass, et. al, “Rifaximin treatment in hepatic encephalopathy,” New England Journal of Medicine, vol. 362, no. 12, pp. 1071-1081, 2010. [4] M. Hudson, et. al, “The impact of rifaximin-α on the hospital resource use associated with the management of patients with hepatic encephalopathy: a retrospective observational study (IMPRESS),” Frontline Gastroenterology, vol. 8, pp. 243-251, 2017. [5] R. J. Aspinall, et al, “Real-world evidence of long-term survival and healthcare resource use in patients with hepatic encephalopathy receiving rifaximin-α treatment: A retrospective observational extension study with long-term follow-up (impress II),” Frontline Gastroenterology, 2022. [6] A. Buxton and C. L. Morgan, “Evaluation of all-cause mortality and healthcare resource use associated with early versus late treatment initiation of rifaximin-α 550 mg in patients with hepatic encephalopathy,” 2023.

Study supported by Norgine Ltd.

NORGINE

Because patients inspire us

Presented at International Society for Pharmacoeconomics and Outcomes Research (ISPOR)-EU 2023, Copenhagen, Denmark.