RWD174

Health Care Resources Associated with Clinical Pneumonia, Bacteremia or Meningitis in Colombian Adults: A Retrospective Database Study.

Arciniegas, J[1], Reyes Sanchez, JM[1], Bolaños-López, J[2], Bello, C[2], Gonzalez, FJ[2], Duque, M[1], Oñate, J[2], Garcia, M[1], Escobar, O[1], Serra, L[3], Lefebvre d'Hellencourt, F[3], Onwumeh-Okwundu, J[3], LaRotta, J[1], Fletcher, M[4]

[1]Pfizer, Colombia. [2]Biociencias-SURA, Colombia. [3]Pfizer, USA. [4]Pfizer, France.

BACKGROUND

Meningitis, bacteremia, and pneumonia are diseases acquired within community settings, are prevalent across the world and can provoke multi-organ failure and in general. Most studies focus on the pediatric population and there is limited information in Colombia about healthcare resource utilization (HCRU) which includes cost, hospitalization, length of stay, consultations, among others.

OBJECTIVE

- To describe the healthcare resources related to the clinical management of pneumonia, bacteremia, or meningitis of adult patients in one health maintenance organization (HMO) in Colombia, Sura.

METHODS

- This is a retrospective, observational-cohort-study in adult patients diagnosed (without a documented etiology) with pneumonia, bacteremia, or meningitis, based on the 10th International Classification of Diseases codes, who received medical care from the HMO services between 2015 and 2022.
- Included patients were older than 18 years and had diagnosis of pneumonia (J13 – J22), bacteremia (A49.2, A49.8, 49.9, A39.4, A39.9, B95.3, A40.3, A41.3, A41.5, A41.8, A41.9) and meningitis (G00, G03.9, A39.9).
- A micro-costing method was used based on data on hospital stay (general ward [GW] and intensive care unit [ICU]) and outpatient care. Cost estimates derived from the Colombian "sufficiency study technical note" and Colombian drug prices and sales database (SISMED)[1,2]. All costs were adjusted to 2023 and converted to US dollars (1 USD =3982.5 COP).
- The data analysis in this study was targeted on generating descriptive statistics, which included the calculation of frequencies, percentages (for qualitative variables), as well as measures of central tendency (such as the mean and median) and variability (e.g. standard deviation [sd] and Interquartile Range, IQR) (for quantitative variables). The statistical analysis was conducted using the R statistical software (v.4.3.1)[3].

RESULTS

- 112,205 patients were observed, most of them presented with outpatient pneumonia (n=92,479, 82.4%), about 7,006 patients presented bacteremia (6.2%) and 412 had meningitis (0.4%). On the other hand, 15,196 pneumonia cases were treated in an inpatient setting.
- Pneumonia and bacteremia patients tended to be females, outpatient pneumonia were 58.7%, inpatient pneumonia 52.5% and bacteremia 54.7% while meningitis patients about the 46.1% of them were female (Table 1).
- By mean age, meningitis cases were youngest (45.1 years, sd 18.7), followed by outpatient pneumonia cases (51.4 years, sd 19.5), bacteremia (60.9 years, sd 20.2) and, inpatient pneumonia cases (63.1 years, sd 19.7) (Table 1).
- In general, clinical cases had one or more comorbidities, which was predominantly seen in those with bacteremia (85.2%) and inpatient pneumonia (88.1%) (Table 1).

Table 1. Cases clinical and demographical characteristics

Variables	Pneumonia		Meningitis	Bacteremia
	Hospital	Ambulatory		
Number of cases	15196	92479	412	7006
Age mean (sd)	63,1 (19,7)	51,4 (19,5)	45,1 (18,7)	60,9 (20,2)
Age group (%)				
18-49	3739 (24,6)	438598 (47,1)	258 (62,6)	2001 (28,6)
50-59	2167 (14,3)	14541 (15,7)	52 (12,6)	1013 (14,5)
60-69	2686 (17,7)	16261 (17,6)	46 (11,2)	1227 (17,5)
70-79	2997 (19,7)	9807 (10,6)	37 (9,0)	1347 (19,2)
>80	3607 (23,7)	8271 (8,9)	19 (4,61)	1418 (20,2)
Female (%)	7981 (52,5)	54278 (58,7)	190 (46,1)	3830 (54,7)
ICU (%)	1817 (12,0)		14 (3,4)	485 (6,9)
Number of comorbidities (%)				
0	1811 (11,9)	27909 (30,2)	133 (32,3)	1037 (14,8)
1	2116 (13,9)	20707 (22,4)	97 (23,5)	925 (13,2)
2	2565 (16,9)	15503 (16,8)	62 (15,0)	1089 (15,5)
3	2636 (17,3)	11542 (12,5)	45 (10,9)	1127 (16,1)
>3	6068 (39,9)	16818 (18,2)	75 (18,2)	2828 (40,4)

RESULTS (cont)

- Specifically, 81,238 cases had information available for any of the analyzed costs. Consistently with the full dataset, most cases presented with pneumonia (n=76,708) - 80.2% outpatient (n= 61,519) and 19.8% inpatient pneumonia (n= 15,189) - followed by bacteremia (n=7,006), and meningitis (n=412).
- The median cost for outpatient pneumonia was 6.9 USD (IQR 17.9) while inpatient pneumonia median cost was 1,733.7 USD (IQR 2,275). For bacteremia it was 2,220.8 USD (IQR 2,734.0), and for meningitis 2,378.7 USD (IQR 2,819.6). The main cost driver was the length of stay (LoS), whether in GW or ICU. For hospitalized cases, those with pneumonia had a median GW LoS of 6 days (IQR 5), for bacteremia 7 (IQR 9) and meningitis 8 (IQR 9). The median ICU LoS for pneumonia was 13 days (IQR 14), for bacteremia 14 days (IQR 18), and meningitis 19.5 days (IQR 15.8).
- In computing the available information by cost category, for those who required any inpatient management, the hospitalization in a general ward was the most prevalent cost-generating event: 91.2% of inpatient pneumonia cases had any cost record and 100% of bacteremia and meningitis, and its median cost ranged between 1,665.6 USD and 2,220.8 USD (Table 2).
- In addition, the medications cost was present in 80.9% of the outpatient pneumonia cases, with a median cost of 4 USD while for inpatient pneumonia it was in 39% of cases with a median cost of 5.6 USD, for bacteremia medications cost was present in 28% of cases with a median cost of 6.6 USD and for meningitis this cost-generating category was in 23.1% and its median cost was 5.8 USD (Table 2).

Table 2. Cost presence and per patient median cost by category

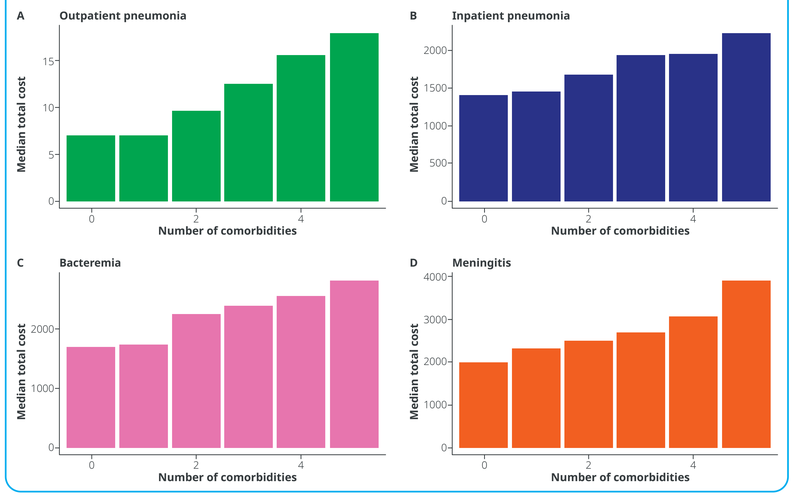
Category	Measure	Outpatient Pneumonia	Inpatient Pneumonia	Bacteremia	Meningitis
GW	% of patient with any cost record	0.0%	91.2%	100.0%	100.0%
	Median cost (USD)	N/A	1,665.6	1,943.2	2,220.8
ICU	% of patient with any cost record	0.0%	11.9%	6.9%	3.4%
	Median cost (USD)	N/A	32,802.9	35,326.2	49,204.4
Laboratories	% of patient with any cost record	35.9%	37.3%	32.4%	26.9%
	Median cost (USD)	13.4	23.1	26.9	23.8
Images	% of patient with any cost record	33.1%	27.7%	19.0%	19.2%
	Median cost (USD)	9.4	9.4	18.8	93.3
Procedures	% of patient with any cost record	2.4%	9.0%	6.8%	13.1%
	Median cost (USD)	12.3	52.1	93.9	160.2
Outpatient visits	% of patient with any cost record	6.7%	19.1%	13.9%	22.1%
	Median cost (USD)	12.4	14.1	13.4	12.1

RESULTS (cont)

Category	Measure	Outpatient Pneumonia	Inpatient Pneumonia	Bacteremia	Meningitis
Drug	% of patient with any cost record	80.9%	38.9%	27.8%	23.1%
	Median cost (USD)	4.0	5.6	6.6	5.8

- Reviewing the total median costs according to the number of comorbidities, an increasing trend is observed, the greater the number of comorbidities, the higher the median cost. The outpatient pneumonia was 6.9 USD for those without comorbidities, while for those with five comorbidities, it was 17.8 USD. For hospitalized pneumonia it was 1,392 and 2,220.8 USD respectively (Figure 1).
- For bacteremia, the total median cost of those without a comorbidity was 1,665.6 USD and for those with five comorbidities, it amounted to 2,775.9. Analogously for the meningitis cases, the median management cost ranged between 1,967.9 USD (no comorbidities) and 3,886.3 USD (five comorbidities).

Figure 1. Median cost and number of comorbidities by disease



CONCLUSION

Among the diseases studied, pneumonia represents the greatest burden, considering that it has the largest number of patients. However, the pneumonia per patient median tended to be lower than those with meningitis and bacteremia. The main drivers of healthcare costs are GW or ICU admissions.

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Financial disclosure: This study was sponsored by Pfizer. Poster presented in ISPOR International, Atlanta May 5-8 2024.