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New York State All-Payer Inpatient Admissions and Emergency Department Visits for Hypoglycemia, 2013

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Introduction

There is a well-documented pay cycle that develops in many American households, where expenditures increase as paychecks and benefits become available and then decrease just prior to the next dispersion of funds.[1,2,3] A California study recently reported that low-income hospital admissions for hypoglycemia increased by 27% during the last week of the month compared to the first week[4] suggesting a link to the exhaustion of food budgets at the end of the month. The analyses in this brief applies the methods outlined by Seligman et al.[4] to provide a summary of the temporal trends for primary and secondary hypoglycemia hospital inpatient admissions and emergency department (ED) visits reported through the New York Statewide Planning and Research Cooperative (SPARCS) system by Article 28 hospitals for January 1, 2013 through December 31, 2013 in New York State.

Methods

Individuals with primary or secondary hypoglycemia, were identified through *International Classification of Diseases,* Ninth Revision (ICD-9), principal diagnosis codes (251.0, 251.1, and 251.2). Individuals with hypoglycemia inpatient admissions or ED visits for reasons other than

[1] Stephens M Jr. "3rd of the month": do Social security recipients smooth consumption between checks? Am Econ Rev. 2003;(93)1:406-422.
[2] Hauffman D, Barenstein M. A monthly struggle for self-control? Hyperbolic discounting, mental accounting, and the fall in consumption between paydys. Bonn, Germany: Institute for the Study of Labor; 2005 Dec. Available from: http://ftp.iza.org/dp1430_rev.pdf
[3] Wig K, Smith C. The art of grocery shopping on a food stamp budget: factors influencing the food choices of low-income women as they try to make ends meet. Public Health Nutr. 2009;12(10):1726-34
[4] Seligman H, Bolger A, Guzman G, Lopez A, Bibbins-Domingo K. Exhaustion of Food Budgets At Month's End AND Hospital Admissions Foy Hypoglycemia. Health Affairs. 2014;33(1):116-123

Highlights

- There is evidence of an increased rate of inpatient hospital admissions for hypoglycemia at months end for persons receiving Medicaid or Medicare.
- Rates of inpatient hospitalizations and ED visits for primary hypoglycemia were highest in individuals who were ages 65 and older, black, male and Medicare insured.
- Hispanics were admitted to hospitals for primary hypoglycemia at a higher rate than non-Hispanics while non-Hispanics utilized the ED for primary hypoglycemia at a higher rate than Hispanics.
- Rates of inpatient hospital admissions increased at the end of the month (weeks 3 and 4) for primary hypoglycemia but remained stable throughout the month in terms of ED visits.
- Further research into the theory of food budget exhaustion leading to hypoglycemia inpatient admissions at months end may be warranted.

diabetes were excluded; including individuals with a secondary diagnosis of insulinoma (ICD-9 codes 211.7 and 0157.4) or sepsis (ICD-9 codes, ICD-9 codes, 020.2, 022.3, 031.0, 036.2, 038.0-038.44, 038.49, 038.8-038.9, 054.5, 415.12, 422.92, 449.0, 771.81, 790.7, 659.30-659.31, 659.33, 78552, 995.91-995.92, 998.02).

The payer typology data element was investigated to identify individuals whose primary payer was either Medicaid, Medicare, or Other.[5] A primary payer of Medicaid was used as a proxy for low-income.

We calculated the rate of inpatient hospital admissions and ED visits attributable to primary and secondary hypoglycemia per 100,000 hospital admissions and ED visits respectively on week of the month overall and by primary payer. To assess within-month trends we used a categorical variable for week. The first seven days of each month were week 1 while the last seven days of the month were week 4. The remaining days of each month were split evenly between week 2 and week 3, with week 3 receiving the extra day as needed.

Data Source

These analyses were based on hospital inpatient admission and emergency department (ED) visit data from the New York State Planning and Research Cooperative System (SPARCS). SPARCS is a comprehensive data reporting system that collects patient level detail on patient characteristics, diagnoses, treatments, services, and charges for every hospital discharge, ambulatory surgery visit, emergency department visit and visits to hospital-based clinics in New York State. From all New York State inpatient Article 28 (acute care) hospitals, 2.1 million inpatient discharges and 5.3 million ED visits were included in this analysis from January 1, 2013 to December 31, 2013.

Findings

Demographic Characteristics

Demographic characteristics of hospital inpatient admissions (Table 1) and ED visits that did not result in hospital admission (Table 4) are presented overall and by primary and secondary diagnosis of hypoglycemia. Rates of inpatient hospitalizations and ED visits for primary hypoglycemia were highest in individuals who were ages 65 and older, black, male and Medicare insured. Hispanics were admitted to hospitals for primary hypoglycemia at a higher rate than non-Hispanics, while non-Hispanics utilized the ED for primary hypoglycemia at a higher rate than Hispanics. Rates of inpatient hospital admissions increased at the end of the month (weeks 3 and 4) for primary hypoglycemia but remained stable throughout the month for ED visits. Trends were similar for secondary hypoglycemia inpatient admissions and ED visits; except that black and non-Hispanic individuals were admitted to inpatient hospitals at higher rates than their counterparts, females had higher rates of ED visits than males, and weekly rates of ED visits fluctuated.

Inpatient Admissions and ED Visits for Hypoglycemia by Payer

Tables 2 and 3 present rates of primary and secondary hypoglycemia inpatient hospital admissions by week of the month and payer. For Medicaid, Medicare, and private health insurance there was a higher rate of inpatient hospital admissions for primary hypoglycemia in week 4 of the month. Individuals enrolled in Medicare had the highest rates of inpatient admissions overall and in week 4 (22.74 and 28.12 per 100,000 admissions respectively). Although the rates of inpatient admissions with a secondary diagnosis of hypoglycemia were higher than for primary inpatient admissions, there was no clear temporal trend by week of the month.

Tables 5 and 6 present rates of primary and secondary hypoglycemia ED visits by week of the month and payer. ED visits for primary hypoglycemia increased substantially in week 4 of the month in Medicaid, while rates fluctuated for Medicare and decreased for private health insurance. There were no clear temporal

[5] Other = Self Pay, Blue Cross/ Blue Shield, Managed Care (Unspecified), Federal/State/Local Government, Corrections, No Payment/ No Charge, Miscellaneous

trends for rates of ED visits by week of the month for individuals with a secondary diagnosis of hypoglycemia. Rates of ED visits for primary and secondary diagnoses of hypoglycemia were highest for Medicare.

Conclusions

This report shows some evidence of an increase in rate of inpatient hospital admissions for hypoglycemia in Medicaid and Medicare at months end. Additionally, rates for inpatient hospital admissions for hypoglycemia were higher for Medicaid and Medicare than for private health insurance. While increasing age and prevalence of diabetes could be a factor in the results for Medicare, this would not explain the results observed for Medicaid. Medicaid and Medicare enrolled populations represent a large percentage of the population living on a fixed income. Further research into the theory of food budget exhaustion leading to hypoglycemia inpatient admissions at months end may be warranted.

Tables

Table 1: Hospital Inpatient Admissions with Hypoglycemia as Primary or Secondary Diagnosis, 2013

		Admissions		Hypoglycemia, Primary Dx			Hypoglycemia, Secondary Dx		
Potential Predictors		**N**	**%**	**N**	**%**	**Rate/ 100,000**	**N**	**%**	**Rate/100,000**
Total		**2,056,514**	**100.00**	**386**	**100.00**	**18.77**	**3,648**	**100.00**	**177.39**
Age	Age: 18-44	611,692	29.74	90	23.32	14.71	823	22.56	134.54
	Age: 45-64	611,682	29.75	121	31.35	19.78	1,224	33.55	200.10
	Age: 65+	833,140	40.51	175	45.33	21.00	1,601	43.89	192.16
Gender	Male	877,165	42.65	184	47.67	20.98	1,615	44.27	184.12
	Female	1,179,349	57.35	202	52.33	17.13	2,033	55.73	172.38
Race	Black	390,749	19.00	135	34.97	34.55	918	25.16	234.93
	Other	465,325	22.63	70	18.13	15.04	732	20.07	157.31
	White	1,200,440	58.37	181	46.89	15.08	1,998	54.77	166.44
Ethnicity	Hispanic	274,023	13.32	70	18.13	25.55	401	10.99	146.34
	Non-Hispanic	1,782,491	86.68	316	81.87	17.73	3,247	89.01	182.16
Payer	Medicaid	503,845	24.50	89	23.06	17.66	871	23.88	172.87
	Medicare	910,418	44.27	207	53.63	22.74	1,862	51.04	204.52
	Private Health Insurance	513,346	24.96	64	16.58	12.47	702	19.24	136.75
	Other	128,905	6.27	26	6.74	20.17	213	5.84	165.24
Week	One	475,390	23.12	79	20.47	16.62	848	23.25	178.38
	Two	543,342	26.42	84	21.76	15.46	981	26.89	180.55
	Three	575,486	27.98	117	30.31	20.33	961	26.34	166.99
	Four	462,296	22.48	106	27.46	22.93	858	23.52	185.60

Table 2: Weekly Rate of Primary Hypoglycemia Inpatient Admissions per 100,000, by Payer, 2013

		Medicaid	Medicare	Private Health Insurance	Other
Week	One	17.05	19.44	11.39	13.58
	Two	18.01	17.90	9.56	11.83
	Three	15.58	25.69	12.45	32.71
	Four	20.52	28.12	16.52	20.71
	Total	**17.66**	**22.74**	**12.47**	**20.17**

Table 3: Weekly Rate of Secondary Hypoglycemia Inpatient Admissions per 100,000, by Payer, 2013

		Medicaid	Medicare	Private Health Insurance	Other
Week	One	163.71	207.62	136.79	193.57
	Two	175.61	207.88	149.94	136.06
	Three	176.34	195.65	107.89	166.29
	Four	174.84	209.48	157.39	169.16
	Total	**172.87**	**204.52**	**136.75**	**165.24**

Table 4: Emergency Department Visits with Hypoglycemia as Primary or Secondary Diagnosis, 2013

		ED Visits		Hypoglycemia, Primary Dx			Hypoglycemia, Secondary Dx		
Potential Predictors		**N**	**%**	**N**	**%**	**Rate/100,000**	**N**	**%**	**Rate/100,000**
Total		**5,259,396**	**100.00**	**2,674**	**100.00**	**50.84**	**2,106**	**100.00**	**40.04**
Age	Age: 18-44	2,910,855	55.35	859	32.12	29.51	988	46.91	33.94
	Age: 45-64	1,553,334	29.53	932	34.85	60.00	630	29.91	40.56
	Age: 65+	795,207	15.12	883	33.02	111.04	488	23.17	61.37
Sex	Male	2,288,208	43.51	1,410	52.73	61.62	824	39.13	36.01
	Female	2,971,188	56.49	1,264	47.27	42.54	1,282	60.87	43.15
Race	Black	1,354,325	25.75	883	33.02	65.20	461	21.89	34.04
	Other	1,372,469	26.10	585	21.88	42.62	440	20.89	32.06
	White	2,532,602	48.15	1,206	45.10	47.62	1,205	57.22	47.58
Ethnicity	Hispanic	1,008,423	19.17	453	16.94	44.92	314	14.91	31.14
	Non-Hispanic	4,250,973	80.83	2,221	83.06	52.25	1,792	85.09	42.16
Payer	Medicaid	1,640,412	31.19	726	27.15	44.26	568	26.97	34.63
	Medicare	988,963	18.80	993	37.14	100.41	651	30.91	65.83
	Private Health Insurance	1,401,552	26.65	584	21.84	41.67	572	27.16	40.81
	Other	1,228,469	23.36	371	13.87	30.20	315	14.96	25.64
Week	One	1,226,727	23.32	636	23.78	51.85	535	25.40	43.61
	Two	1,369,449	26.04	689	25.77	50.31	540	25.64	39.43
	Three	1,465,935	27.87	747	27.94	50.96	588	27.92	40.11
	Four	1,197,285	22.76	602	22.51	50.28	443	21.04	37.00

Table 5: Weekly Rate of Primary Hypoglycemia for Emergency Department Visits per 100,000, by Payer, 2013

		Medicaid	Medicare	Private Health Insurance	Other
Week	One	43.84	105.11	42.04	31.14
	Two	42.23	96.95	47.48	26.91
	Three	43.98	105.59	38.63	30.19
	Four	47.36	93.24	38.33	33.02
	Total	**44.26**	**100.41**	**41.67**	**33.20**

Table 6: Weekly Rate of Secondary Hypoglycemia for Emergency Department Visits per 100,000, by Payer, 2013

		Medicaid	Medicare	Private Health Insurance	Other
Week	One	35.49	74.58	45.06	26.59
	Two	34.53	65.02	38.14	26.91
	Three	33.75	64.36	43.3	25.55
	Four	33.91	59.66	36.47	23.33
	Total	**34.63**	**65.83**	**40.81**	**25.64**

Definitions

- **SPARCS.** The Statewide Planning and Research Cooperative System (SPARCS) is a comprehensive data reporting system established in 1979 as a result of cooperation between the health care industry and government. Initially created to collect information on discharges from hospitals, SPARCS currently collects patient level detail on patient characteristics, diagnoses and treatments, services, and charges for every Article 28 (acute care) hospital discharge, ambulatory surgery, emergency room visits, and visits to hospital-based outpatient clinics in New York State.

- **Unit of analysis.** The unit of analysis for this report is the hospital inpatient admission or the emergency room visit, not the patient. Therefore, if a single person visited the emergency room on three separate occasions during the time frame of analysis they would be counted as three distinct emergency room visits.

- **Emergency Room Visit.** Emergency room visits were identified as institutional outpatient discharges with at least one of the following codes: Revenue Code 0450, 0451, 0452, 0456, 0459, 0981.

- **Primary Payer.** Primary Payer is based upon the Source of Payment Typology I Code indicated on the SPARCS inpatient or emergency room admission record. A visit may also have been paid in part by another payer, but Source of Payment Typology I identifies the payer which is principally responsible for the cost of the visit.

- **Hypoglycemia**. Primary and Secondary ICD-9 Diagnosis codes that were used to identify hypoglycemia appear in the table below:

ICD-9 Code	Value
251.0	HYPOGLYCEMIC COMA
251.1	HYPOGLYCEMIA NEC
251.2	HYPOGLYCEMIA NOS

Contact Information

We welcome questions, comments and feedback on this Statistical Brief.

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