Characteristics and treatment pathways in pediatric and adult hidradenitis suppurativa: An examination using real world data

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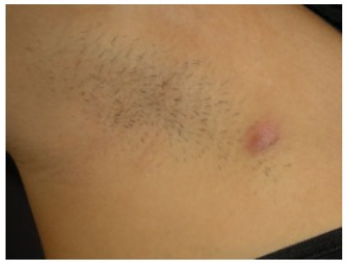
Motivation

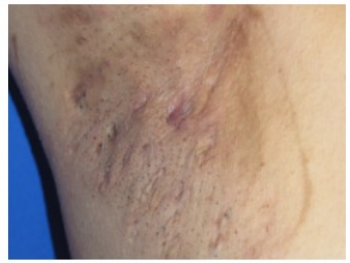
- Limited research exists examining real-world pharmacologic treatment patterns and therapeutic procedures in pediatric and adult hidradenitis suppurativa (HS) patients.

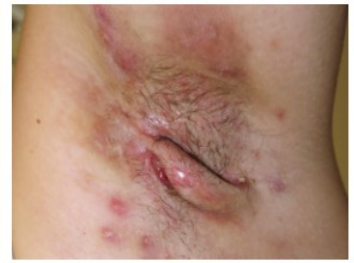
- Our study leveraged 3 large real-world databases to understand pediatric and adult HS patients' disease characteristics and treatment patterns.

- **Objective** is to evaluate the clinical treatment characteristics of pediatric and adult HS patients.

Background


Hurley Stage I hidradenitis suppurativa


Hurley Stage II hidradenitis suppurativa


Hurley Stage III hidradenitis suppurativa

- **HS is a chronic, recurring, inflammatory skin disease.**
- Age of HS onset typically occurs **in the second or third decade of life** but can also occur in pediatric patients (aged <18 years), although generally after the onset of puberty.
- Among adolescents, HS can be associated with **significant comorbidities including diabetes, metabolic syndrome, psychiatric disorders, and inflammatory arthritis. Pain and bipolar disorders, psychoses, schizophrenia, and suicide occur at higher rates in subjects with HS than in those without HS.**
- Current guidelines recommend treatment with topical and/or systemic antibiotics, hormonal interventions, analgesics and, in selected cases, the tumor necrosis factor (TNF) inhibitor monoclonal antibody adalimumab, and surgical excision.
- **More recently (2015), biological therapies** approved to treat HS subjects with moderate to severe disease; use associated with reductions in the count of abscess and nodules, pain score, and the impact of HS on daily life.
- **There have been very few adequately powered studies** conducted to study the efficacy of biologics in HS subjects and studies using real world data have been limited in studying this recently approved drug class for HS treatment.
- Although several HS clinical guidelines exist, they lack specific language regarding treatment of pediatric subjects. The North American clinical management guidelines for treatment state that the management strategies are similar for pediatric and adult HS populations.
- **This work fills a knowledge gap by providing details on the real-world pharmacotherapy treatment practices and comparing adults and children.**

Methods

- Data – 3 observational databases converted to the OMOP CDM version 5.3
  - IBM MarketScan Commercial Claims and Encounters Database (CCAE)
  - Optum De-Identified Clinformatics Data Mart Database Socio-Economic Status (Clinformatics)
  - The IBM MarketScan Multi-State Medicaid Database (MDCD)

- Phenotype – incident HS subjects required two HS codes – 1st code is index with 2nd code in 31 to 365 days after index; PPV 83% to 95%. Publication here

- All subjects required to have at least 365 days of continuous observation prior to the first HS qualifying diagnosis

- Pediatric HS <18 years of age, adults >=18 years of age

- ATLAS used to generate cohorts and conduct the characterization and treatment pathway analyses.
  - topical treatments (clindamycin and resorcinol), oral antibiotics (tetracycline, doxycycline, lymecycline, minocycline, amoxicillin, pristinamycin, ceftriaxone, and metronidazole), biologics (adalimumab, infliximab, anakinra, and ustekinumab), and surgical treatments (laser procedures, incision and drainage of abscess, excision of skin and subcutaneous tissue), and acne surgery (eg, marsupialization, opening or removal of multiple milia, comedones, cysts, pustules).

- CohortDiagnostics used to estimate incidence rates.

Results

- Interactive results here

Table I. Prevalence per 100,000 population of HS among pediatric (<18 years) and adult (≥18 years) populations by database, year, and sex

		Pediatric			Adult		
Database	Year	Males	Females	Overall	Males	Females	Overall
CCAE	2016	2.01	16.15	8.92	10.05	28.84	19.95
	2017	3.47	18.72	10.93	9.62	31.35	21.02
	2018	3.46	16.42	9.80	11.36	37.25	24.85
	2019	3.74	16.73	10.10	11.63	39.60	26.15
	2020	4.08	18.67	11.21	12.68	41.49	27.59
	2021	2.69	15.71	9.06	9.76	33.93	22.29
MDCD	2016	4.21	22.49	13.06	24.76	63.71	49.69
	2017	3.21	20.24	11.46	21.25	52.23	41.20
	2018	4.22	22.01	12.82	22.96	56.89	44.69
	2019	4.88	22.84	13.56	23.43	61.17	47.69
	2020	4.18	20.83	12.24	20.81	64.44	48.30
	2021	2.84	9.34	5.99	13.15	36.79	27.91
Clinformatics	2016	1.81	11.50	6.55	7.79	19.93	14.10
	2017	2.28	14.59	8.30	9.41	22.16	16.05
	2018	1.73	16.19	8.80	9.04	24.33	17.03
	2019	2.74	14.22	8.35	10.13	23.98	17.40
	2020	2.25	15.92	8.93	9.25	25.58	17.85
	2021	3.62	13.22	8.31	8.27	22.85	15.96

Table II. Selected characteristics of adult and pediatric HS subjects

	Adult			Pediatric		
	CCAE (*n = 16121)	MDCD (*n = 11383)	Clinformatics (*n = 9514)	CCAE (*n = 1894)	MDCD (*n = 2674)	Clinformatics (*n = 700)
% Female	78.0	82.4	73.9	83.5	82.8	85.3
Mean age ± SD (years)	36.5 ± 12.4	35.8 ± 12.7	43.0 ± 16.4	15.1 ± 1.9	14.7 ± 2.1	15.0 ± 1.9
Age groups (%)						
0-3	–	–	–	<1	<1	–
4-6	–	–	–	–	<1	<1
7-11	–	–	–	5.5	8.4	6.0
12-17	–	–	–	94.5	91.4	93.9
18-64	99.8	97.7	86.7	–	–	–
>65	<1	2.3	13.3	–	–	–
†Race (%)						
White	–	43.1	59.9	–	30.1	53.7
Black or African American	–	42.3	19.3	–	51.1	17.3
Asian	–		3.4	–		4.1
†Ethnicity (%)						
Non hispanic	–		82.7	–		75.2
Hispanic	–	4.1	11.9	–	8.8	13.3
Median time prior to index date (days)	1167	1215	954	1583	1831	622
Median time after index date (days)	567	694	537	661	764	576
‡Select clinical characteristics (%)						
§Obesity	35.7	45.1	39.5	16.3	30.6	17.7
Type 1 diabetes mellitus	1.0	2.4	2.0	<1	1.2	<1
Type 2 diabetes mellitus	11.2	19.9	20.9	1.1	3.8	1.3
Depression	12.8	25.3	16.7	9.8	11.1	9.9
Anxiety	17.3	29.3	20.4	12.0	12.2	12.7
Cellulitis	8.9	13.4	10.8	6.9	10.5	7.6
Pilonidal cyst	1.5	1.7	1.5	2.0	1.6	1.3
Acne	14.6	8.6	12.3	27.1	17.7	27.3
Folliculitis	6.1	6.4	6.9	7.5	6.8	6.6
Furuncle	5.7	5.9	6.2	6.7	6.4	6.1
Crohn's disease	1.5	1.5	1.7	<1	<1	<1
Ulcerative colitis	<1	<1	<1	<1	<1	<1
Arthropathies						
Rheumatoid arthritis	1.5	1.7	2.6	<1	<1	<1
Psoriatic arthritis	<1	<1	<1	<1	<1	<1
Ankylosing spondylitis	<1	<1	<1	<1	<1	<1

*Indicates the total number of subjects with HS identified using the phenotype algorithm requiring two HS diagnostic codes.
†Race and ethnicity data is unavailable for CCAE; race and ethnicity data in MDCD and Clinformatics has misclassification bias.
‡Assessed in the 180 days prior and 30 days post index.
§Assessed in the 365 days prior to index.

Results - pathways

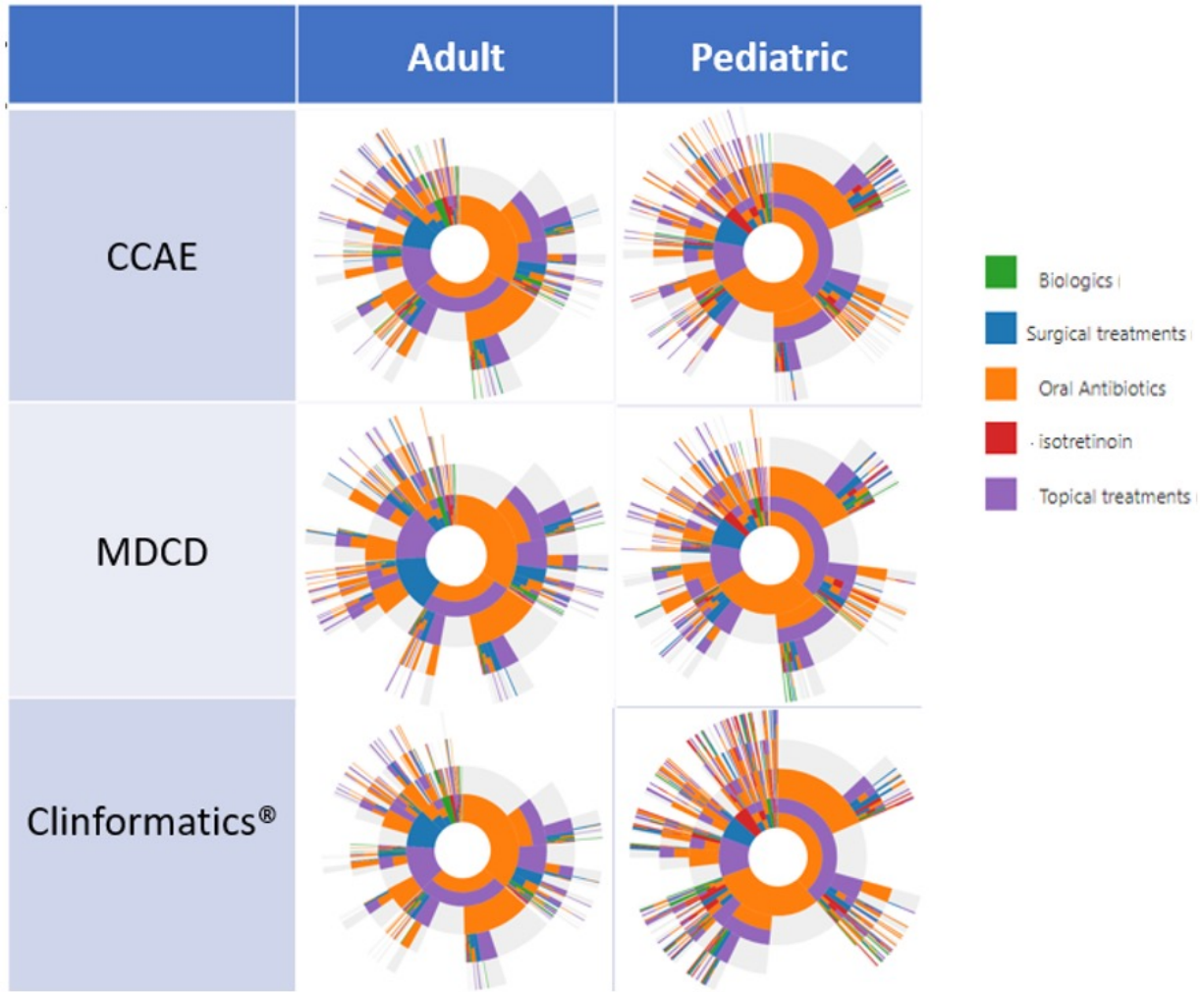


Table III. Percentage of first line treatments for adults and pediatric HS subjects by database

Database	Treatment	Adult	Pediatric
CCAE	Topical treatments (Clindamycin, Resorcinol)	13.4	11.2
	Oral Antibiotics	33.4	28.3
	Biologics (infliximab, adalimumab, anakinra, ustekinumab)	2.4	1.1
	Surgical treatments (Laser treatment on skin, excisions, unroofing)	9.3	7.3
	Isotretinoin	1.4	3.3
	Oral Antibiotics and topical treatments (Clindamycin, Resorcinol)	30.3	38.6
MDCD	Topical treatments (Clindamycin, Resorcinol)	14.6	11.4
	Oral Antibiotics	34.2	30
	Biologics (infliximab, adalimumab, anakinra, ustekinumab)	1.6	1.3
	Surgical treatments (Laser treatment on skin, excisions, unroofing)	15.1	7.6
	Isotretinoin	0.8	2.9
	Oral Antibiotics and topical treatments (Clindamycin, Resorcinol)	24.9	36.6
Clinformatics	Topical treatments (Clindamycin, Resorcinol)	13.3	11.1
	Oral Antibiotics	36.4	30.8
	Biologics (infliximab, adalimumab, anakinra, ustekinumab)	2.5	1.1
	Surgical treatments (Laser treatment on skin, excisions, unroofing)	11.1	6.2
	Isotretinoin	1.1	4.2
	Oral Antibiotics and topical treatments (Clindamycin, Resorcinol)	26.4	38.6

Discussion

- Treatment patterns are similar in children and adults with HS.
- HS is more prevalent among females compared to males.
- Among HS patients, access to biologic treatments is low, and use in children appears more limited than adults.
- Increasing HS patients' access to dermatologists would increase access to biologic therapies and may improve outcomes.
- As additional biologic use data as well as other newly approved treatments become available, re analysis may reveal the impact of on treatment decisions, and potentially outcomes.