Multiple Emergency Department Visits for a Diagnosis of Kawasaki Disease: An Examination of Risk Factors and Outcomes

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Objectives To determine predictors of >1 emergency department (ED) visit for a Kawasaki disease diagnosis in a quaternary care pediatric hospital and compare outcomes between patients with 1 vs >1 visit for Kawasaki disease diagnosis.

Study design Medical records of patients evaluated for Kawasaki disease between January 2006 and August 2018 at Boston Children's Hospital were abstracted for demographic and clinical data. Predictors of >1 visit were explored using logistic regression and classification and regression tree analysis.

Results Of 530 patients diagnosed with Kawasaki disease, 117 (22%) required multiple ED visits for Kawasaki disease diagnosis. Multivariable regression and classification and regression tree analysis identified ≤2 Kawasaki disease criteria (OR 33.9; 95% CI 18.1-63.6), <3 days of fever at the first visit (OR 3.47; 95% CI 1.77-6.84), and non-White race (OR 2.15; 95% CI 1.18-3.95) as predictors of >1 visit. There were no significant differences in duration of hospitalization, day of illness at initial Kawasaki disease treatment, intravenous immunoglobulin resistance, need for adjunctive therapies, or coronary artery outcomes between patients diagnosed with Kawasaki disease at initial visit vs subsequent visits.

Conclusions Incomplete Kawasaki disease criteria, fewer days of fever, and non-White race were significant predictors of multiple ED visits for Kawasaki disease diagnosis in this single institution study. Our findings underscore the importance of maintaining a high index of suspicion for Kawasaki disease in patients with <4 Kawasaki disease criteria. Further research is needed to determine causes for increased healthcare use in non-White patients to receive a Kawasaki disease diagnosis. *(J Pediatr 2021;232:127-32)*.

Kawasaki disease is an acute febrile vasculitis of childhood and the leading cause of acquired heart disease in children in developed countries. Coronary artery aneurysms (CAAs) are the most worrisome manifestation of Kawasaki disease, with increased risk of CAA in those diagnosed beyond 10 days after fever onset.[1-3] Despite established clinical criteria,[1] diagnosing Kawasaki disease remains a challenge in the absence of a diagnostic test.

Previous studies identified risk factors for delayed diagnosis of Kawasaki disease,[4,5] including age <6 months, incomplete presentation (<4 Kawasaki disease criteria), protracted appearance of clinical symptoms, and greater distance between patient's residence and treatment facility. Little is known, however, about why some patients with Kawasaki disease require >1 visit to the emergency department (ED) before a diagnosis is made.

Our primary objectives were to identify demographic, clinical, and laboratory characteristics of patients who required at least 2 ED visits before receiving a Kawasaki disease diagnosis and to determine whether such patients experienced worse outcomes. Our overarching goal was to identify potential pitfalls in evaluating children with Kawasaki disease.

Methods

We conducted a retrospective cohort study of patients seen through the Boston Children's Hospital (BCH) ED and diagnosed with Kawasaki disease between January 1, 2006, and August 31, 2018. Patients diagnosed and/or initially treated for Kawasaki disease at outside institutions were excluded. For patients who required >2 visits for a diagnosis of Kawasaki disease, we included data from the first visit and the visit leading to admission. We included data only from the first episode of Kawasaki disease for those patients with recur-

BCH	Boston Children's Hospital
CAA	Coronary artery aneurysm
ED	Emergency Department
IVIG	Intravenous immunoglobulin
SES	Socioeconomic status
z max	maximum z score

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rent Kawasaki disease. This study was approved by the BCH institutional review board.

Electronic medical records were reviewed for demographic characteristics, clinical course, as well as laboratory and echocardiographic data at all visits. Demographic characteristics included sex, date of birth, age at the first visit, race, city of residence, ZIP code, and calculated distance from their primary residence to the hospital in miles. Patient race and ethnicity were self-reported and abstracted from the medical record. Race categories included White, Black, Asian, Native American, Hispanic/Latino, and Middle Eastern/North African. If a patient self-identified with >1 race, we included all reported races. Patients who did not identify a race were included as Other. We also calculated a neighborhood socioeconomic status (SES) score developed by Diez Roux et al using data from the 2010 US Census that uses 6 variables related to wealth and income.[6] The neighborhood summary score was available for patients seen until August 2017 and was constructed by summing the z scores for each of the 6 variables, with greater scores indicating greater neighborhood SES. Clinical data included day of the week and time of day of presentation at BCH and day of fever. The degree of involvement of a rheumatologist (first call for Kawasaki disease diagnosis at BCH) at each visit was noted to be telephone communication between the ED and rheumatology consult team, rheumatology consult team saw the patient in the ED, or no documented involvement of rheumatology at the first visit. If the patient was discharged at the first visit, we collected data on alternative diagnoses. For patients who required additional visits to receive a Kawasaki disease diagnosis, we collected the same information as for the first visit, as well as the day of illness at subsequent visits. Duration of hospitalization for Kawasaki disease in days was recorded. The clinical criteria for Kawasaki disease, including conjunctivitis, rash, erythema/edema at the hands and feet, cervical lymphadenopathy >1.5 cm in diameter, and oral mucous membrane changes were reviewed, and the presence or absence of any of the 5 criteria were documented at each visit.

We recorded laboratory data at each visit, including complete blood counts with differential; serum sodium; aspartate aminotransferase; alanine aminotransferase; serum albumin; erythrocyte sedimentation rate; C-reactive protein; and urinalysis, including number of white blood cells per high-powered field. In addition, we collected available data assessing for concurrent infections including the results of blood and urine cultures, throat cultures, rapid strep test, mononuclear spot test (nonospot), Epstein–Barr viral capsid antigen immunoglobulin M, Epstein–Barr viral capsid antigen immunoglobulin G, and adenovirus/respiratory syncytial virus/influenza detected by either rapid antigen/direct fluorescent antibody, polymerase chain reaction, or respiratory viral culture.

Echocardiographic data extracted from the medical record included the maximum z score (z max) of the left anterior descending and right coronary arteries at any time within 6 weeks of the first visit. Treatment data included the number of doses of intravenous immunoglobulin (IVIG) administered, the number of patients with IVIG resistance (defined as receiving retreatment with IVIG 36 hours or more after the first IVIG due to persistent or recrudescent fever), and any additional immunomodulatory therapies.

Categorical variables were summarized with frequencies and percentages and compared for patients diagnosed at visit 1 vs visit 2 using the Fisher exact test. Continuous variables were summarized with medians and ranges and compared using the Wilcoxon rank sum test. Logistic regression analysis also was used to explore the relationships between patient characteristics and number of healthcare visits. Factors significant at the 0.2 level in univariate analysis were considered for inclusion in a multivariable model; $P < .05$ as assessed by the likelihood ratio test was required for retention in the final model. ORs are presented with 95% CIs. A c statistic was used to assess discrimination of the final model. Relationships between patient characteristics and >1 ED visit for diagnosis also were explored using recursive partitioning (classification and regression tree analysis) to create a decision tree. All data were collected and managed using REDCap electronic data capture tools hosted at BCH.

Results

Between January 2006 and August 2018, 530 patients were seen in the ED and diagnosed with Kawasaki disease (**Table I**). More than three-quarters of patients (n = 413, 78%) were diagnosed with Kawasaki disease at the first ED visit, whereas 117 (22%) required >1 visit to receive the diagnosis. Of those 117 patients, 108 (92%) required 2 visits, 8 (7%) required 3 visits, and 1 (1%) required 4 visits for diagnosis. Sociodemographic characteristics according to diagnosis after 1 vs >1 visit are summarized in **Table I**. The majority were male (n = 345, 65%). Nearly one-half were White (48%, n = 255); 19% (n = 100) were Asian, and 15% (n = 78) were Black.

Patients who required multiple visits for Kawasaki disease diagnosis were found to live closer to the hospital, with a median distance of 10.0 miles, compared with 21.8 miles for patients diagnosed at the first visit ($P < .001$). Non-White patients were more likely to live closer to the hospital (10.8 miles vs 27.1 miles, $P < .001$). There were also significant differences between the groups based on the day of the week and the time of day at first visit. Patients who presented on a Sunday were more likely to require multiple visits to receive a diagnosis ($P = .034$). Within a 24-hour time frame divided into 8-hour blocks, patients whose first visit occurred between 11:00 P.M. and 6:59 A.M. were also more likely to require multiple visits to receive a diagnosis ($P = .009$). Not surprisingly, the degree of rheumatology involvement was a significant factor associated with >1 ED visit for Kawasaki disease diagnosis. In the majority of patients who needed 2 visits for a Kawasaki disease diagnosis (n = 82, 70%), rheumatologists had no documented involvement at the first visit ($P < .001$).

Table I. Demographics and disease characteristics of patients evaluated for Kawasaki disease

Characteristics	1 visit for Kawasaki disease diagnosis (n = 413)	>1 visit for Kawasaki disease diagnosis (n = 117)	*P*
Age at first visit, y	3.2 (0.2, 16.4)	2.9 (0.2, 13.8)	.32
Male sex	271 (66%)	74 (63%)	.66
Race			<.001
White	218 (53%)	37 (32%)	
Black/African American	49 (12%)	25 (21%)	
Asian	72 (17%)	28 (24%)	
Native American	0 (0%)	1 (1%)	
Latino	43 (10%)	22 (19%)	
Middle Eastern	1 (<1%)	2 (2%)	
>1 race	24 (6%)	2 (2%)	
Other	6 (1%)	0 (0%)	
Race non-White vs race White	195 (47%)	80 (68%)	<.001
Distance from BCH, miles	21.8 (9.0, 38)	10.0 (5.5, 26)	<.001
Neighborhood summary score	−0.29 (−13.4, 12.2)	−1.08 (−13.1, 11.7)	.30
First visit on Sunday	42 (10%)	21 (18%)	.034
First visit between 11:00 P.M. and 6:59 A.M.	40 (9%)	22 (19%)	.009
Days from fever onset to first visit, d	6 (1, 19)	4 (0, 20)	<.001
Days from fever onset to first visit			<.001
≤3	37 (9%)	56 (48%)	
4-5	143 (35%)	39 (33%)	
≥6	233 (56%)	22 (19%)	
Days from fever onset at second visit, d	Not applicable	6 (2,21)	
Days of fever at Kawasaki disease diagnosis	6 (1, 19)	6 (2, 21)	
Patients with >10 d of fever at Kawasaki disease diagnosis	27 (7%)	10 (9%)	
Rheumatology involved at the first visit			<.001
Yes	413 (100%)	35 (30%)	

Values shown are a number with accompanying percentage in parentheses or the median value with the range in parentheses. Distance from the hospital is shown with the IQR in parentheses.

We calculated the median neighborhood summary score for 470 patients and did not observe a significant difference between patients who were diagnosed at the first visit vs those who required multiple visits for a Kawasaki disease diagnosis (−0.29 vs −1.08, respectively, $P = .30$). We also explored primary care settings for the cohort. Most patients, including those who required multiple visits for Kawasaki disease diagnosis, had a private pediatrician. Of the 117 patients with >1 ED visit for diagnosis, 84 had a private pediatrician, 26 were followed at an academic general pediatrics clinic, and 7 were followed at a community health center. Non-White children were more likely to require multiple visits for Kawasaki disease diagnosis compared with White children ($P < .001$). Patients who required multiple visits for a Kawasaki disease diagnosis had fewer days of fever at the first visit compared with patients who were diagnosed at the first visit (median 4 days vs 6 days, $P < .001$, **Table I**). However, the median number of days of fever at actual Kawasaki disease diagnosis was the same between the 2 groups (6 days). The majority of patients diagnosed at the second visit had <4 criteria at first visit (n = 103, 88% vs 22% of patients with <4 criteria diagnosed at first visit, $P < .001$, **Table II**). With regards to the specific Kawasaki disease clinical criteria themselves, the absence of any individual criterion at the initial examination was significantly associated with needing a subsequent visit for a Kawasaki disease diagnosis ($P < .001$, **Table II**). Compared with White patients, non-White patients were significantly less likely to have conjunctivitis, rash, and oral changes documented at the first visit ($P = .001$, $P < .001$, $P = .018$, respectively, **Table III**; available at www.jpeds.com).

In classification and regression tree analysis, the strongest discriminator of needing multiple visits for Kawasaki disease diagnosis was ≤2 Kawasaki disease criteria at the first visit (**Figure**; available at www.jpeds.com). In total, 80% of the patients who had ≤2 Kawasaki disease criteria at the first visit required a subsequent visit for Kawasaki disease diagnosis. Within that group, the number of days of fever at the first presentation was a significant contributor; 94% of patients with ≤2 Kawasaki disease criteria and ≤3 days of

Table II. Kawasaki disease clinical criteria at initial visit

Clinical criteria at visit 1	1 visit for Kawasaki disease diagnosis (n = 413)	>1 visit for Kawasaki disease diagnosis (n = 117)	*P*
Number of clinical criteria at first visit			<.001
≤2	20 (5%)	83 (71%)	
3	70 (17%)	20 (17%)	
4-5	323 (78%)	14 (12%)	
Extremity changes	325 (79%)	27 (23%)	<.001
Rash	370 (90%)	76 (65%)	<.001
Conjunctivitis	398 (96%)	52 (45%)	<.001
Oral changes	378 (92%)	30 (26%)	<.001
Cervical lymphadenopathy	150 (36%)	23 (20%)	<.001

Values shown are number with accompanying percentage in parentheses.

fever at the first visit required a subsequent visit for Kawasaki disease diagnosis. In patients who had ≤2 Kawasaki disease criteria but >3 days of fever at the first visit, non-White patients were more likely to need a second visit for Kawasaki disease diagnosis. In a multivariable regression analysis (**Table IV**), number of clinical criteria ≤2 (OR 33.9; 95% CI 18.1-63.6), non-White race (OR 2.15; 95% CI 1.18-3.95), and ≤3 days of fever before first visit (OR 3.47; 95% CI 1.77-6.84) were independent risk factors, and the model had a c statistic of 0.87.

We did not find significant differences in clinical outcomes between patients diagnosed with Kawasaki disease after 1 visit compared with those who needed >1 visit (**Table V**; available at www.jpeds.com). Both groups received IVIG at the same day of illness (median of 6 days). Duration of hospital stay did not differ between groups (median of 4 days for both groups). IVIG resistance was similar in patients with 1 vs >1 visit (19% vs 24%) as was addition of adjunctive therapies. Coronary artery outcomes did not differ significantly between patients who needed one visit vs those diagnosed at visit 2 or later (z max = 1.63 vs z max = 1.68, respectively). Large or giant aneurysms, defined as a z score ≥10.0,[1] were uncommon across the entire cohort. Nine of the 413 patients diagnosed with Kawasaki disease at visit 1 (2%) and 1 of the 117 patients diagnosed with Kawasaki disease at the second visit (1%) had giant aneurysms. Finally, for patients needing multiple visits for Kawasaki disease diagnosis, the most common diagnosis at the first visit was viral syndrome (n = 45, 35%). However, we did not find a significant association between receiving a specific diagnosis at the first visit and requiring subsequent visits for eventual Kawasaki disease diagnosis (**Table VI**; available at www.jpeds.com).

Table IV. Multivariable logistic analysis looking at factors contributing to needing >1 visit for Kawasaki disease diagnosis

Factors	OR	95% CI	P
Number of clinical criteria ≤2	33.9	(18.1-63.6)	<.001
Race non-White	2.15	(1.18-3.95)	.013
Days from fever onset to first visit ≤3	3.47	(1.77-6.84)	<.001

N = 530 patients, c statistic = 0.87.

Discussion

Our findings add to previous literature that identified incomplete Kawasaki disease as an independent predictor of delayed diagnosis.[5] In our study, the likelihood of having additional visits for Kawasaki disease diagnosis was especially high in patients with ≤3 days of fever and with an incomplete clinical presentation of Kawasaki disease at the first visit. It is not surprising that fewer criteria at first visit in combination with fewer days of fever would lead to a diagnosis of Kawasaki disease not being considered. However, when assessing risk factors for delayed diagnosis of Kawasaki disease, Anderson et al found that many patients diagnosed after 10 days of illness presented only with fever at the initial visit, thus reinforcing the importance of continued follow-up for development of new Kawasaki disease signs/symptoms and fever resolution.[4] Children who present with incomplete Kawasaki disease have a similar risk as those with complete presentation to develop CAA and may be at particular risk for coronary artery changes because of a delay in diagnosis.[7]

Non-White patients were significantly more likely to require a subsequent visit for a Kawasaki disease diagnosis, with two-thirds of the patients requiring >1 visit being of non-White race. Furthermore, race was an important discriminator in a specific clinical scenario wherein non-White patients with >3 days of fever and ≤2 clinical Kawasaki disease criteria at first visit were significantly more likely to require a subsequent visit to receive Kawasaki disease diagnosis. Previous Kawasaki disease literature examining the relationship between patient race and outcome has been mixed, with some studies reporting Black patients to be significantly more likely to have IVIG resistance and to have delayed normalization of their echocardiograms[8,9] and other studies reporting that no differences in response to IVIG, similar echocardiogram findings, and Black race as being a potentially protective factor against CAA.[10-12] Our study identifies a disparity in healthcare use for Kawasaki disease evaluation in non-White patients. The reasons for this are unclear. Compared with White patients, non-White patients were significantly less likely to have rash documented at the first visit. It may be more difficult to accurately document rashes in non-White patients due to a lack of educational resources highlighting different presentations of rashes in patients of color, thus leading to potential delays in diagnosis.[13] However, the absence of any criterion was associated with needing more visits for diagnosis, raising the possibility that other factors, including implicit bias, may be involved.[14]

Residence at a closer distance to the hospital also was found to be a significant risk factor for needing subsequent additional visits for Kawasaki disease diagnosis. This is in contrast to previous studies that showed that greater distance from the hospital was positively correlated with a greater number of illness days at diagnosis and with patients who were diagnosed after day 10 of illness.[5] We hypothesize that patients who lived closer to the hospital were more likely to be discharged home based on the presumption that it would be easier for follow-up if needed, given the closer proximity, whereas providers may have been more conservative with patients who traveled from a greater distance for Kawasaki disease evaluation at our hospital. Another factor we identified as being associated with at least 2 ED visits for diagnosis was the first visit occurring between 11:00 P.M. and 6:59 A.M. It is possible that decision-making is

altered, for example, by fatigue, between 11:00 P.M. and 6:59 A.M.[15] Finally, the absence of rheumatology involvement at the first visit was associated with the second visit, but our study design does not allow us to determine a causal relationship.

SES was not significantly associated with number of visits for a Kawasaki disease diagnosis in our cohort. These results are consistent with a previous study that examined risk factors for delayed diagnosis of Kawasaki disease that did not find SES to have a significant association with delayed diagnosis, with the caveat being that SES was measured by ZIP code rather than a composite score.[5,16] However, lower SES was identified as an independent predictor for delayed treatment, longer hospitalization, and increased risk of large/giant coronary artery aneurysms in another study of patients with Kawasaki disease.[17] Patients who needed >1 ED visit for Kawasaki disease diagnosis lived closer to the hospital and presented to the ED late at night for evaluation with only a few days of fever thus fitting a narrative of children with working parents who may not have a medical home for their child that accommodates their schedule and who may use the ED in lieu of seeing their primary care physician.[18] However, although we could not confirm that the pediatric outpatient practices met criteria for a patient-centered medical home, we found that the majority of these patients had a private pediatrician. This suggests that SES and type of primary care provider may not explain increased ED use.

We did not find a significant association between multiple visits and worse clinical outcomes. Specifically, there were no significant differences between our 2 groups with regards to duration of hospitalization, rates of IVIG resistance, and echocardiogram findings, looking at z max over a 6-week period and the number of patients with giant coronary artery aneurysms. We also did not observe a significant difference in the number of patients needing additional adjunctive therapies between the 2 groups. Although previous studies of delayed diagnosis of Kawasaki disease demonstrated increased risk of CAAs,[4] patients in our cohort differed as they received a timely diagnosis across both groups—those who needed 1 ED visit and those who needed >1 ED visit. Specifically, the finding of similar coronary outcomes in our study was likely mediated by the fact that patients in both groups were diagnosed and treated on day 6 of illness.

Our study should be viewed in light of its limitations. As a retrospective cohort study, clinical data were dependent on provider documentation. We limited our study to patients who were seen and diagnosed through the BCH ED before Kawasaki disease diagnosis and thus may be biasing our results toward a patient population that is more likely to use to the ED (non-White and living closer to the hospital) and not capturing patients who required multiple visits at healthcare settings outside of BCH. There were also limitations related to the use of neighborhood summary score, which was dependent on the 2010 US census data. We attempted to ensure the accuracy of patients' street address at time of initial presentation but could not control for variation over time neighborhood SES and the possibility that patients may have had unstable location of residence. Our findings at a single urban center and our practice of primary evaluation of patients with Kawasaki disease by pediatric rheumatologists on a Kawasaki disease team may not be generalizable to other centers in the US.

Further study is needed to determine the causes for increased healthcare use in non-White patients for Kawasaki disease diagnosis, including the potential role of implicit bias. Our findings underscore the need to maintain a high index suspicion for Kawasaki disease in children with fevers and fewer than 4 Kawasaki disease criteria. ■

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50 Years Ago in *THE JOURNAL OF PEDIATRICS*

You Are What You Eat: "tu sei quello che mangi"

Anderson T, Fomon S. Commercially Prepared Infant Cereals: Nutritional Considerations J Pediatr 1971;78:788-93.

In this study, Anderson and Fomon sought to understand the nutritional composition of infant cereals. They investigated how 34 women prepared infant cereal for their children by mixing the constituent parts. They looked at the main brands and types of infant cereals available at that time (Gerber, Beech-Nut, and Heinz), and compared precooked dry cereal (prepared with either water, milk, or formula) and wet cereals strained with fruit. The children studied ranged from 5 weeks to 14 months of age.

There were 15 dry cereals and 7 wet-packed varieties offered by 2 companies in 1971. Over 50 years, there has been significant exponential growth in the infant cereal market, which is now a multibillion-dollar enterprise. One noteworthy dry cereal composition was that of the high-protein formulation, which contained 35.5 g of protein in 100 g of cereal. Given the age range of children in this study, this single serving of prepared cereal alone likely delivered more than 3 g/kg of protein. In addition, the prepared wet cereals containing strained fruit were hypocaloric incomplete nutrition, containing less than 25% the calories of their dry cereal counterparts, and only 1.5 g of protein per 100 g of cereal. Although the cereals were fortified with iron, as the authors note, iron was provided as sodium iron pyrophosphate, which has subsequently been found to have approximately 60% the bioavailability as ferrous sulfate. Regardless, when given in the proper dose, this amount likely is still sufficient to avoid iron deficiency anemia. This article alerted the medical community to the high variability in nutritional composition of infant cereals, bringing an awareness to the lack of regulatory oversight, setting the stage for the changes in the infant formula industry over the next decade.

In the late 1970s, infants began presenting to hospitals around the country with seizures, renal failure, and hypochloremic metabolic acidosis. This was traced to chloride-free infant formula, created for marketing purposes owing to the popular concern that infants were receiving excessive dietary salt.[1] Accordingly, the US Food and Drug Administration enacted the Infant Formula Act of 1980, which established minimum nutrient requirements and set the grounds for quality control and regulatory procedures related to the manufacturing of infant formula.[2] To our knowledge, commercially available high-protein infant cereal with a protein content as high as that found in the 1970s does not currently exist; this may be due, in part, to US Food and Drug Administration oversight. Today, 50 years later, the concept persists that infant food is generally regarded as safe, but continued vigilance and studies are needed to determine if specific additives are, indeed, beneficial to infants or if contaminants such as arsenic in rice cereal engender harm.

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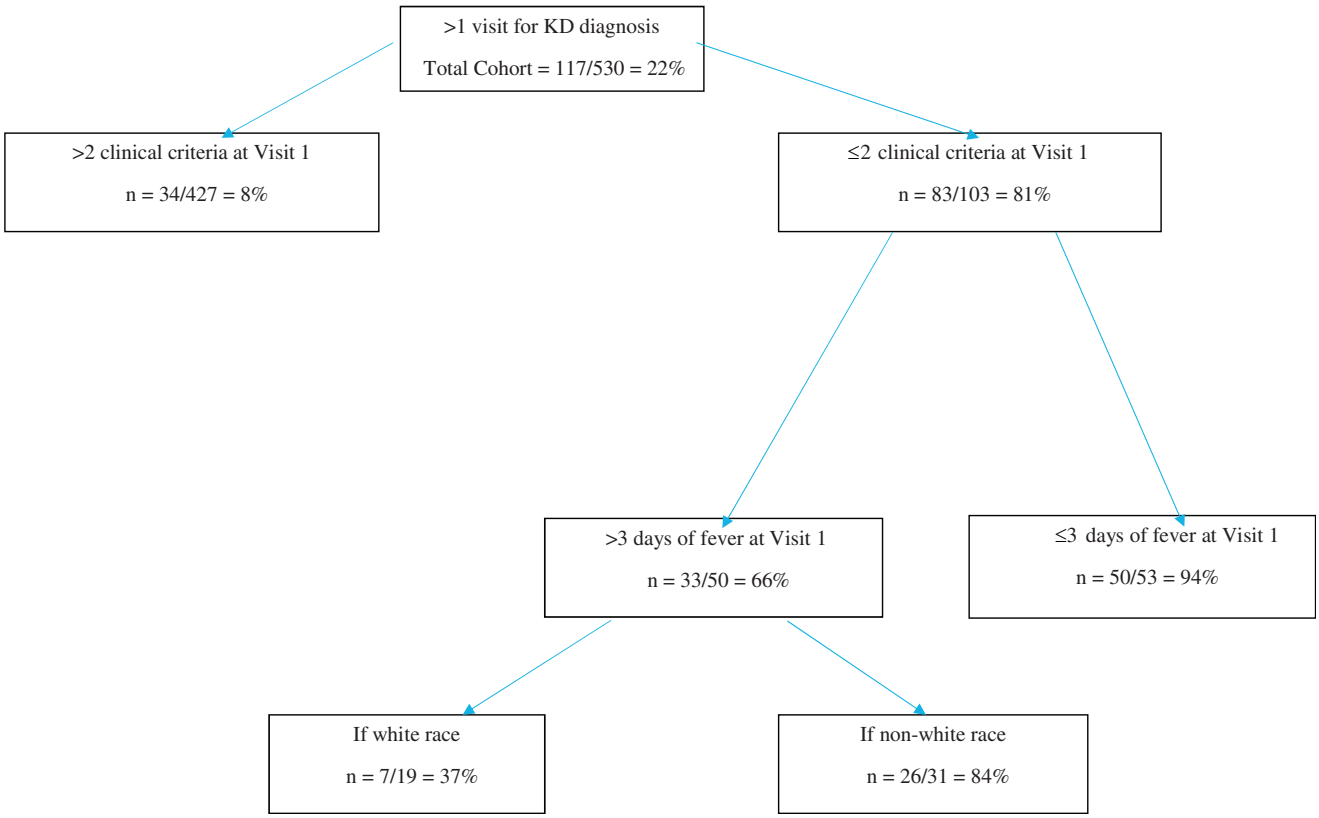

Figure. Decision tree examining factors contributing to needing >1 visit for Kawasaki disease diagnosis. Denominator represents total number of patients with that specific discriminator. Numerator represents the number of patients within that discriminator who needed >1 visit for Kawasaki disease diagnosis. *KD*, Kawasaki disease.

Table III. Clinical and demographic characteristics by race

Comparisons by race	White (n = 255)	Non-White (n = 275)	*P* value
Age at first visit, y	3.5 (0.2, 16.4)	2.9 (0.3, 12.9)	.003
Distance from BCH, miles	27.1 (1.4, 1478)	10.8 (1.1, 3096)	<.001
Neighborhood summary score	0.43 (−13.4, 12.2)	−2.09 (−13.4, 11.7)	<.001
Kawasaki disease criteria at initial visit			
Conjunctivitis	230 (90%)	220 (80%)	.001
Rash	233 (91%)	213 (77%)	<.001
Extremity changes	174 (68%)	178 (65%)	.41
Oral changes	208 (82%)	200 (73%)	.018
Cervical lymphadenopathy	83 (33%)	90 (33%)	1.0
Number of Kawasaki disease criteria at first visit			.024
<4	80 (31%)	113 (41%)	
4-5	175 (69%)	162 (59%)	

Values shown are a number with accompanying percentage in parentheses or the median value with the range in parentheses. Distance from the hospital is shown with the IQR in parentheses.

Table V. Clinical outcomes of patients referred for Kawasaki disease

Outcomes*	1 visit for Kawasaki disease diagnosis (n = 413)	>1 visit for Kawasaki disease diagnosis (n = 117)
Duration of hospitalization, d	4 (2, 19)	4 (2, 19)
Day of illness at first IVIG treatment	6 (1, 19)	6 (2, 21)
Treatment during Admission		
Single dose of IVIG	315 (77%)	83 (72%)
Two doses of IVIG	47 (12%)	17 (15%)
Infliximab (5-10 mg/kg/dose)	2 (0.5%)	0 (0%)
Methylprednisolone (30 mg/kg/dose)	0 (0%)	1 (0.9%)
Prednisone RAISE protocol (1 mg/kg/dose BID)	41 (10%)	14 (12%)
Cyclosporine	4 (1%)	0 (0%)
Anakinra	1 (0.2%)	2 (2%)
IVIG resistance	75 (18%)	27 (23%)
z-max LAD or RCA within 6 wk of diagnosis	1.63 (−1.64, 23.0)	1.68 (−0.58, 20.8)
z-max LAD or RCA within 6 wk ≥10.0	9 (2%)	1 (1%)

BID, twice daily; *LAD*, left anterior descending; *RCA*, right coronary artery; *RAISE*, Randomized control trial to Assess Immunoglobulin plus Steroid Efficacy.
Values shown are number with accompanying percentage or the median value with the range in parentheses.
*All differences were not significant with $P > .05$.

Table VI. Alternative diagnoses given at first visit for patients requiring subsequent visit for Kawasaki disease diagnosis

Diagnoses	Number
Bacterial	
Cervical lymphadenitis	12 (9%)
Urinary tract infection	8 (6%)
Acute otitis media	6 (5%)
Scarlet fever	5 (4%)
Streptococcal pharyngitis	4 (3%)
Rule out serious bacterial infection	2 (2%)
Retropharyngeal phlegmon	1 (0.8%)
Adenoiditis	1 (0.8%)
Cellulitis	1 (0.8%)
Toxin-mediated infection	1 (0.8%)
Vaginitis	1 (0.8%)
Viral	
Viral syndrome	45 (35%)
Upper respiratory infection	9 (7%)
Gastroenteritis	9 (7%)
Viral exanthem	8 (6%)
Adenovirus	3 (2%)
Herpangina	1 (0.8%)
Mononucleosis	1 (0.8%)
Coxsackievirus	1 (0.8%)
Other	
Evaluation for possible Kawasaki disease	3 (2%)
Drug rash	1 (0.8%)
Serum sickness-like reaction	1 (0.8%)
Macrophage activation syndrome	1 (0.8%)
Reactive arthritis	1 (0.8%)
Diabetes mellitus	1 (0.8%)
Toxic synovitis	1 (0.8%)
Possible subacute phase of Kawasaki disease	1 (0.8%)
Total	129

Alternative diagnoses with accompanying percentage in parentheses given to patients at the first visit who were later diagnosed with Kawasaki disease.