

Distinguishing Kawasaki disease from other febrile conditions in a US cohort with the Kawasaki Disease Gene Expression Profiling (KiDs-GEP) classifier

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Background Timely diagnosis of Kawasaki disease (KD) is challenging but may become more straightforward with the Kawasaki Disease Gene Expression Profiling (KiDs-GEP).

Objectives To compare the KiDs-GEP classifier score between KD patients and febrile controls in a US cohort.

Methods Biobanked whole blood RNA samples from 100 KD patients and 400 febrile controls who were diagnosed at Rady Children's Hospital in San Diego between 2010 and 2019 were retrospectively collected. All patients were under 18 years of age and blood samples were obtained within the first 12 days of illness and prior to treatment with IVIG. RNA expression of the collected blood samples was measured with qRT-PCR and analyzed with the KiDs-GEP classifier.

Results The KD patients had a median age of 3.05 years and 56.0% were male, which was comparable to the febrile control group (median age of 3.30 months and 56.3% male). KD patients had a significantly higher KiDs-GEP classifier score (mean 25.6 [IQR 24.0-27.1] than the febrile control patients (mean 21.0 [IQR 19.4-23.0], $p < 1 \times 10^{-10}$). The lowest classifier score was observed for patients with viral infections (mean 20.4 [IQR 19.1-22.1]), making them easiest to distinguish from KD patients with the KiDs-GEP classifier.

Conclusion The KiDs-GEP classifier score was significantly higher in KD patients than in febrile control patients. These results are consistent with our previous study and indicate that the KiDs-GEP classifier may be a useful tool to discriminate KD patients from febrile control patients.