

**Evaluation of different coronary artery Z-Score models in a German population based study cohort of 310 patients**

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**Objectives**

Kawasaki disease (KD) can be complicated by Coronary Artery Aneurysms (CAA). Diagnostic accuracy of CAA significantly influences subsequent diagnostic and therapeutic decisions. Today, 7 different Z-Score models, standardising the numerical measurement of the Coronary artery diameter's, have been established from measurements of healthy North American and Asian children. These scores have however never been uniformly evaluated in a representative KD patient cohort. In addition, no recommendation exists which score may be best useful in Western Europe.

**Methods**

We recruited from the active population-based German Pediatric Surveillance Study (ESPED) for KD and from the Ludwig-Maximilian-University of Munich echocardiographic patient cohort. Echocardiographic reports performed during the acute phase of KD were systematically screened regarding specifications of coronary artery diameters. All patients evaluated fulfilled the AHA diagnostic criteria for KD. From all available coronary artery diameters, Z-Scores were calculated according to all available models. The Z-scores were compared for normal distribution and stability concerning the diagnosis of coronary artery ectasia (CAE, Z-Score  $>2$  and  $\leq 2,5$ ) and coronary artery aneurysm (CAA, Z-Score  $> 2,5$ ).

**Results**

In 310 out of 408 echocardiographic reports at least one coronary artery diameter was reported. In all but 5 reports of those without given coronary artery dimensions, coronary arteries were judged as normal by the treating physician. Applying the different Z-score models to the documented measurements, the percentage of CAA varied considerably; LMCA 25 – 45%, RCA and LAD 30 – 39% respectively. CAE was less frequently diagnosed and therefore showed less variance (LMCA 8-11%, RCA 2-6%, LAD 1,5 – 6%). The Kobayashi- and Dallaire Z-Score models showed the most concordant results among all Coronary arteries, these scores however revealed higher rates of CAA than the others.

**Conclusions**

There are considerable discrepancies between the different Z-Score models available in terms of determining CAA and CAE. Since the Z-Score models proposed by Kobayashi and Dallaire, obtained comparable results to the investigators here and higher rates of CAA, we would propose to use either one of these models. Underdiagnosis and delayed treatment initiation or exacerbation might be prevented that way.