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超声在完全与不完全川崎病患儿冠状动脉病变评估中的应用价值*

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摘要 目的：探讨超声在完全与不完全川崎病（Kawasaki Disease，KD）患儿冠状动脉病变（Coronary artery lesions，CAL）评估中的应用价值。**方法：**2019 年 6 月到 2021 年 5 月选择在西安医学院第二附属医院住院诊治的 83 例川崎病患儿，其中完全川崎病患儿 43 例（完全组），不完全川崎病患儿 40 例（不完全组）。所有患儿都给予超声检查，评估两组的临床表现、血液学指标、冠状动脉病变情况以及超声的诊断价值。**结果：**完全组的球结膜充血、皮疹、口唇破裂、手足硬肿、颈部淋巴结肿大等发生率高于不完全组（*P*>0.05）。两组的白细胞计数、血红蛋白对比差异有统计学意义（*P*<0.05），C 反应蛋白、血小板、白蛋白对比差异无统计学意义（*P*>0.05）。完全组的冠状动脉病变发生率为 60.5 %，高于不完全组的 27.5 %（*P*<0.05）。在 83 例患儿中，超声诊断为完全川崎病 42 例，不完全川崎病 41 例，超声对完全与不完全川崎病患儿的鉴别诊断敏感性与特异性为 97.7 %（42/43）和 100.0 %（40/40）。**结论：**完全与不完全川崎病患儿在临床表现、冠状动脉病变与实验室检测指标上都存在一定的差异，超声能鉴别诊断完全与不完全川崎病患儿的敏感性与特异性都比较好。

关键词：完全川崎病；不完全川崎病；冠状动脉病变；超声；临床表现；鉴别诊断价值

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The Values of Ultrasound in the Assessment of Coronary Artery Lesions in Children with Complete and Incomplete Kawasaki Disease*

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ABSTRACT Objective: To investigate the values of ultrasound in the evaluation of coronary artery lesions (CAL) in children with complete and incomplete (Kawasaki Disease, KD). **Methods:** A total of 83 children with Kawasaki disease were selected from the Second Affiliated Hospital of Xi 'an Medical University from June 2019 to May 2021, including 43 children with complete Kawasaki disease (complete group) and 40 children with incomplete Kawasaki disease (incomplete group). All children received ultrasound examination to evaluate the clinical manifestations, hematological indicators, coronary artery lesions and the diagnostic value of ultrasound in the two groups. **Results:** The incidence of conjunctival hyperemia, skin rash, lip rupture, hard swelling of hands and feet, cervical lymphadenopathy in the complete group were higher than that in the incomplete group (*P*>0.05). The white blood cell count and hemoglobin compared between the two groups were significantly different (*P*<0.05), and the difference in C-reactive protein, platelets, and albumin compared were not statistically significant (*P*>0.05). The incidence of coronary artery disease in the complete group were 60.5 %, which were higher than 27.5 % in the incomplete group (*P*<0.05). In the 83 children, there were 42 cases were diagnosed as complete Kawereaki disease by ultrasound and 41 cases were incomplete Kawereaki disease. The sensitivity and specificity of ultrasound for differential diagnosis of children with complete and incomplete Kawereaki disease were 97.7 % (42/43) and 100.0 % (40/40). **Conclusion:** Children with complete and incomplete Kawereaki disease have certain differences in clinical manifestations, coronary artery lesions, and laboratory test indicators. Ultrasound can differentiate between children with complete and incomplete Kawereaki disease with better sensitivity and specificity.

Key words: Complete Kawereaki disease; Incomplete Kawereaki disease; Coronary artery disease; Ultrasound; Clinical manifestations; Differential diagnosis value

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前言

川崎病(Kawasaki Disease,KD)又称皮肤粘膜淋巴结综合征,是一种以全身中小血管炎症为主要病理改变的临床疾病[1,2]。该病多发生于 5 岁以下儿童,在婴幼儿中高发,且发病率呈逐年上升趋势。川崎病主要的病理改变为全身性血管炎,临床主要表现为四肢硬化性水肿、持续发热、非化脓性颈部淋巴节肿大、多形性皮疹等[3]。不过该病缺乏较特异性的实验室检查指标,特别是在发病早期,很难诊断明确[4]。川崎病根据临床表现是否典型分为完全川崎病 (Complete Kawasaki disease,CKD) 和不完全川崎病(Incomplete Kawasaki disease,IKD),后者即具有川崎病的特点但又不完全符合川崎病的诊断特点,具有极强的隐蔽性。部分患儿在急性期临床症状没有全部出现,还有部分症状出现时间延迟, 为此在临床上容易出现误诊及漏诊,常致预后不良引起严重并发症[5,6]。川崎病可引起多种心血管系统并发症, 最易累及冠状动脉, 形成冠状动脉病变(Coronary artery lesions,CAL),严重情况下可心肌梗死,从而严重影响患儿的预后[7,8]。超声心动图是一种简单、安全的检查方法,也具有可复性强、没有辐射等优势,并且可密切、全面、动态观察心脏功能及冠状动脉病变情况,在判定冠状动脉病变方面也具有重要效果[9,10]。本文具体探讨了超声在完全与不完全川崎病患儿冠状动脉病变评估中的应用价值,以促进早期鉴别冠状动脉病变。现报道如下。

1 资料与方法

1.1 一般资料

2019 年 6 月到 2021 年 5 月选择在西安医学院第二附属医院住院诊治的川崎病患儿 83 例,其中完全川崎病患儿 43 例(完全组),不完全川崎病患儿 40 例(不完全组)。

纳入标准:患儿家长知情同意本研究;医院伦理委员会批准了此次研究;年龄 2-8 岁;符合完全川崎病或不完全川崎病的诊断标准。

排除标准:临床与检测资料不全者;合并先天性肝肾异常患儿;调查期间死亡的患儿。

两组的性别、年龄、体重、身高等对比差异无统计学意义(P>0.05)。见表 1。

表 1 一般资料

Table 1 General Information

Groups	n	Gender(male / female)	Age (year of age)	Body Weight (kg)	Height (cm)
Complete group	43	23/20	6.28±0.58	24.02±1.33	122.08±10.42
Incomplete group	40	22/18	6.33±0.22	24.22±1.47	122.76±9.81

1.2 超声检查

所有患儿均给予超声检查,采用美国 GE 公司 vivid7 彩色多普勒超声诊断仪 (型号:GE 730), 探头频率为 2.0-4.3 MHz (相控阵探头,编号:1328YP4)。患儿保持安静,取和仰卧位,采用超声显示左、右冠状动脉,测量内径,观察冠状动脉管壁厚度、毛糙、回声与冠状动脉的走向。

1.3 观察指标

(1)诊断标准:不完全川崎病:发热≧5 d,具有 2 项或者 3 项临床表现指:CRP≥ 30 mg/L、贫血、ESR≥ 40 mm/h、ALB≤ 30 g/L、ALT 与 AST 升高、血小板 >450×10^9/L、WBC≥ 15×10^9/L、尿 WBC≥ 10 个 /HP。完全川崎病:发热≧5 d,合并有以下 5 条临床表现中至少 4 条:唇充血皲裂,杨梅舌,和 / 或口咽部粘膜红斑;多形性红斑;球结膜非化脓性充血;恢复期指趾端膜状脱皮;急性期掌趾红斑,手足硬性水肿;颈部淋巴结肿大。

(2)冠状动脉病变:1)扩张:内径局部扩张;2)中型冠状动脉瘤:4 mm< 扩张部分内径≤ 8 mm;3)巨大冠状动脉瘤:>8 mm 的动脉瘤。同时调查调查与记录所有患儿的临床表现与实验室相关检测指标,包括球结膜充血、皮疹、口唇破裂、手足硬肿、颈部淋巴结肿大、白细胞计数、血红蛋白、血小板、C-反应蛋白、白蛋白等。

1.4 统计方法

选择 SPSS19.00 软件进行本研究数据分析,计数资料以例数、百分比(n,%)表示,采用 χ^2 检验;符合正态分布的计量数据以均数±标准差($\bar{x}\pm s$)表示,采用 t 检验,P<0.05 为差异有统计学意义。

2 结果

2.1 临床表现对比

比较两组的临床表现可知,完全组的球结膜充血、皮疹、口唇破裂、手足硬肿、颈部淋巴结肿大等发生率高于不完全组(P>0.05)。见表 2。

2.2 血液学指标对比

经对比两组的血液指标发现,两组的白细胞计数、血红蛋白对比差异有统计学意义(P<0.05),C 反应蛋白、血小板、白蛋

表 2 两组临床表现对比(n,%)

Table 2 Comparison of Clinical Performance (n,%)

Groups	n	Globular conjunctival congestion	Erythra	Liial lip	Hand and foot hard swelling	Neck lymph nodes enlargement
Complete group	43	41(95.3%)*	39(90.7%)*	40(93.0%)*	37(86.0%)*	38(88.4%)*
Incomplete group	40	25(62.5%)	22(55.0%)	23(57.5%)	9(22.5%)	13(32.5%)

Note: Compared with incomplete group group, *P<0.05.

白对比差异无统计学意义（P>0.05）。见表 3。

表 3 两组血液学指标对比（均数±标准差，$\times10^9$/L）

Table 3 Comparison of two-group hematology indicators (average ± standard differenc, $\times10^9$/L)

Groups	n	W.B.C($\times10^9$/L)	Hemoglobin ($\times10^9$/L)	C reactive protein (mg/L)	Blood platelet ($\times10^9$/L)	Albumin(g/L)
Complete group	43	12.89±3.14*	112.09±9.28*	65.88±2.58	554.29±100.37	35.68±3.16
Incomplete group	40	17.92±2.22	103.98±10.32	66.09±3.14	552.98±89.83	35.88±2.73

Note: Compared with incomplete group group, *P<0.05.

2.3 冠状动脉病变情况对比

经对比两组的冠状动脉情况可知，完全组的冠状动脉病变发生率为 60.5 %，高于不完全组的 27.5 %（P<0.05）。见表 4。

表 4 两组冠状动脉病变情况对比（n）

Table 4 Comparison of coronary lesions in the two groups (n)

Groups	n	Expansion	Medium-size coronary aneurysm	Giant coronary aneurysm	Total
Complete group	43	14	8	4	26(60.5%)
Incomplete group	40	6	5	0	11(27.5%)*

Note: Compared with incomplete group group, *P<0.05.

2.4 诊断价值

经分析发现，在 83 例患儿中，超声诊断为完全川崎病 42 例，不完全川崎病 41 例，超声对完全与不完全川崎病患儿的鉴别诊断敏感性与特异性为 97.7 %（42/43）和 100.0 %（40/40）。见表 5。

表 5 超声在完全与不完全川崎病患儿中的鉴别诊断价值（n）

Table 5 Differential Diagnosis Value of Ultrasound in Children with Complete and incomplete Kawasaki Disease (n)

Final Diagnosis	Ultrasonic		Total
	Complete Kawasaki Disease	Incomplete Kawasaki Disease	
Complete Kawasaki Disease	42	1	43
Incomplete Kawasaki Disease	0	40	40
Total	42	41	83

3 讨论

川崎病是一种以全身血管炎为主要病变的急性发热、出疹性疾病，多发病于小儿。研究发现，该病缺乏完全有效的判断标准，且相关临床表现较典型的较少，容易造成误诊。当该病未诊断和医治及时，将会造成冠状动脉的损害，严重者最终会导致多脏器的损害，存在一定的死亡率[11,12]。白细胞计数、血红蛋白为两种综合反映患儿病情的重要蛋白，容易在发病早期出现异常改变，对于完全川崎病的早期诊断均有实际意义[15]。C 反应蛋白是由活化巨噬细胞分泌的细胞因子刺激诱导肝细胞产生的一种急性时相蛋白，在健康机体中，其表达量很低。白蛋白是除 C 反应蛋白外的另一种非特异性急性时相蛋白，由肝细胞所合成。二者均属分泌型蛋白质，不过随着病程的延长，升高的 C 反应蛋白、白蛋白有可能转为阴性[16,17]。

川崎病作为一种急性发热出疹性疾病，可活化炎症细胞，导致机体免疫功能障碍，产生大量炎症细胞因子，从而对冠状动脉造成损伤[18]。组织病理学发现川崎病患儿在急性期可出现阻力血管炎症伴冠状动脉病变和白细胞浸润，严重情况可致血栓形成或猝死，从而导致机体出现发生缺血性心脏病[19]。本研究显示完全组的球结膜充血、皮疹、口唇破裂、手足硬肿、颈部淋巴结肿大等发生率高于不完全组（P>0.05）；两组的白细胞计数、血红蛋白对比差异有统计学意义（P<0.05），C 反应蛋白、血小板、白蛋白对比差异无统计学意义（P>0.05），结合 Ren Y[13,14] 和 Zeng Y Y[13,14]等相关研究分析：完全川崎病患儿在临床上的特征比较多样，不过临床诸多表现有的不出现在同一时间段内，考虑为小儿免疫反应不完善及体格检查时因患儿体位原因触诊等情况有关。

还有研究显示川崎病是发生动脉粥样硬化的危险因素，川崎病后遗症是成人心肌梗死、猝死发生的重要原因[20,21]。由于冠状动脉病变危险性大，是一个长期动态变化过程，为此进行早期诊断也具有重要价值。超声可重复动态观察起始段入口处冠状动脉的病变状况，能有效测量内径扩张情况，对判断动脉瘤、血栓形成及狭窄也具有重要价值[22]。且较冠状动脉造影相比，因患儿胸壁薄、脂肪少，超声易获得清晰冠状动脉图像，具有可重复利用、无创、直观、便捷、方便等优点，与冠状动脉造影的符合率在 90.0 %以上，还可用于检查心脏的形态结构[23]。本研究

显示完全组的冠状动脉病变发生率为 60.5 %，高于不完全组的 27.5 %（P<0.05）。当前有研究显示，随着病程的发展，合并有冠状动脉病变异常的川崎病患儿，可转归为冠状动脉瘤缩小、冠状动脉闭塞、闭塞后再通等[24]。建议对于有冠状动脉异常病变的川崎病患儿需动态地观察其冠状动脉的变化，特别是早期行超声检查可增加冠状动脉病变的早期诊断几率[25-27]。

当前临床上对于不完全川崎病的诊断主要依靠临床表现、实验室指标、查体等结果，但是临床表现特异性不强，在临床上的应用具有一定的局限性[28,29]。本研究显示在 83 例患儿中，超声诊断为完全川崎病 42 例，不完全川崎病 41 例，超声对完全与不完全川崎病患儿的鉴别诊断敏感性与特异性为 97.7 %和 100.0 %，表明超声诊断具有较高的价值。本文结果证明了超声诊断的灵敏度与特异性，相关研究[30-32]发现，超声在动态观察冠状动脉内径、扩张程度、内壁回声、管腔内情况和心脏腔室改变等方面具有重要优势，结合其他各类因素，其能够在患儿的 KD 诊断、治疗、随访中提供重要的参考信息，但注意如果早期超声正常仍不能排除川崎病的可能性，应连续监测冠状动脉表现，有利于不完全川崎病病例的进一步确诊。本研究也有一定的不足，纳入观察的因素比较少，可能在观察分析上存在偏倚，将在后续分析中进一步改进研究方法与分析方法，继续深入研究。

综上所述，完全与不完全川崎病患儿在临床表现、冠状动脉病变与实验室检测指标上均存在一定的差异，超声在鉴别诊断完全与不完全川崎病患儿的敏感性与特异性方面具有较高的价值，为川崎病的临床诊断提供了一定的理论基础。

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