

SphygmoCor和肾脏疾病

肾功能逐渐丧失会导致慢性肾病(CKD)或慢性肾功能不全(CRI)。慢性肾病患者会演变成永久性肾衰竭,即终末期肾病,而永久性肾衰竭的唯一治疗方法是透析和肾移植。肾病患者出现致命性中风或心脏病发作的危险性比较高。SphygmoCor®系统可以实施无创伤性测量,了解那些会增加心血管危险性的大血管病的进展,从而为早期发现高危患者及治疗疾病提供了一种手段。

发病率和生存率

2001年,估计在美国有740万成人具有慢性肾病的生理性指征,有超过30万人接受了终末期肾病的治疗。每年有近10万人被诊断为患有终末期肾病,而糖尿病和高血压是报告的主要病因。患者一旦接受透析达三个月,其生存率就会从第一年的77%急剧下降到第十年的9%¹。慢性肾病患者患心血管疾病的机率较普通人群高3-30倍;研究发现,这种差异在年轻人中尤其明显。另外,发生致命性或非致命性心血管事件的危险性远远超过肾病进展的危险性²,从而死于心血管并发症的慢性肾病患者要多于演变成终末期肾病的患者³。

心血管病仍然是终末期肾病和慢性肾病患者的主要死因,因此心血管疾病的防治一直被认为是治疗这些高危患者的一个主要目标⁴。慢性肾病患者占人口总数的10%,其中80%的患者会过早地死于心血管疾病,甚至在他们尚为演变成终末期肾病之前就过世了。

动脉硬化

慢性肾病和终末期肾病患者患心血管疾病的危险性异常地高,其中部分原因是这些患者的心血管危险因素较普通人群更普遍,如高血压、高血胆固醇、糖尿病和运动减少⁵。

但是,评定传统的心血管危险因素尚不足以解释为什么终末期肾病患者的死亡率会如此之高。目前,预测血液透析患者因心血管病而死亡的最有力的指标与大血管的结构和功能有关^{6,7}。研究发现,主动脉脉波速度(PWV)⁶和更有意义的主动脉增大指数(AIx)⁷是预测接受血液透析的终末期肾病患者发病率和死亡率的独立性预测指标,与其它已知会影响患者预后的因素无关。在这些患者中,AIx每增加10%,死于心血管疾病和各种疾病的危险性就增加大约50%,而PWV每增加1m/s,经过调整的总体死亡率就会增加39%⁷。这些患者中,AIx和PWV的范围分别是 26 ± 15 和 11.7 ± 3.0 m/s。重要的是,这些关联性与已知的其它危险因素无关,如肱动脉血压⁷。

随着动脉硬度的增加,中心收缩压也会增加,从而增加心脏负荷及对心肌的需求。动脉硬度的增加可以通过改变动脉系统对心脏的压力负荷,从而引起高血压、左心室肥厚和功能障碍以及心肌灌注下降,并可加速这些病症的进展。所有这些改变在慢性肾病和终末期肾病患者中都很常见。SphygmoCor®系统通过“主动脉血压分析”和“脉波速度”模块可以评定这些重要参数。

据报道,血管钙化是引起终末期肾病患者动脉硬度增加的一个主要原因。研究发现,在接受透析治疗的患者中,大血管⁸和冠状动脉⁹的钙化与动脉硬度增加密切相关。另外,随着主动脉PWV的增加,冠状动脉的钙化程度也随之成比例地增加⁹。这些发现具有重要意义,因为对于终末期肾病患者,与动脉粥样硬化有关的动脉钙化是可以预防的¹⁰。

最近的研究发现，接受透析治疗的儿童中，动脉壁会出现显著的结构异常，进而引起大血管硬化，表现为AIx和PWV¹¹增加。这表明这些指标对于评定和监测肾病儿童的心血管危险因素具有重要意义。

虽然慢性肾病患者容易死于心血管性疾病³，但对这些患者的动脉硬度研究并不像对终末期肾病患者的研究那样深入。但既往的研究证实，主动脉硬度(PWV)和全身动脉硬度(主动脉增大指数-AIx)增加与慢性肾病、高血压^{12,13}、糖尿病^{14,15,16,17}、动脉粥样硬化¹⁸和高胆固醇血症¹⁹患者中常见的其它病症有关。最近研究发现，在慢性肾病患者中^{21, 22}，动脉硬度确实与有轻微肾功能损害²⁰的透析前的慢性肾病患者有关，且动脉硬度随肾功能的下降(表现为肾小球滤过率下降)而增加。

越来越多的文献表明，心血管药物^{23,24,25,26}、血液透析时间^{27,28,29}、慢性水盐过多³⁰、肾移植^{31, 32}和体育锻炼³³对肾病和高血压患者的动脉硬度都有影响。最近，有研究用SphygmoCor®系统³⁴评定了肾病患者接受透析治疗后内皮细胞功能的改变。这提示，用该系统判断治疗和干预的效果，不仅可以通过中心性血压、主动脉和全身动脉硬度改变来衡量，还可以通过内皮细胞的功能改变来衡量。

因此，对于处于不同阶段的肾病患者来说，动脉硬度都是判断预后和治疗效果的一个重要指标。使用SphygmoCor®系统可以评价动脉硬度及其对心脏的临床影响。

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