

香港版偏瘫上肢功能测试评定脑卒中患者上肢功能的效度和信度研究

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【摘要】 目的 探讨香港版偏瘫上肢功能测试(FTHUE-HK)评定脑卒中患者上肢功能的效度和信度。**方法** 采用FTHUE-HK、Fugl-Meyer量表上肢部分(FMA)和改良巴氏指数(MBI)对42例入选脑卒中患者在1周内进行2次评定,分析其FTHUE-HK、FMA和MBI评定结果,并验证FTHUE-HK的效度;分析2次FTHUE-HK的评定结果,验证FTHUE-HK的重测信度和评估者间信度。**结果** 2次FTHUE-HK评定结果与FMA总分具有高度相关性($r=0.981, 0.982, P<0.01$),且与MBI总分高度相关($r=0.892, 0.896, P<0.01$)。FTHUE-HK的重测结果和组间结果高度相关,其重测组内相关系数 $ICC=0.983$,组间相关系数 $ICC=0.985$ 。**结论** FTHUE-HK量表评定脑卒中后上肢功能状况具有良好的效度和信度。

【关键词】 功能; 测试; 脑卒中; 效度; 信度

Validity and reliability of the Hong Kong version of the functional test for the upper extremities of hemiplegic stroke patients Zhang Yanzhao*, Huang Qin, Wang Gang, Li Kaiyuan, Pei Ya, Liu Yongjin. * Department of Rehabilitation, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430022, China

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【Abstract】 Objective To quantify the validity and reliability of the Hong Kong version of the functional test for the Hemiplegic Upper Extremity (FTHUE-HK). **Methods** Forty-two stroke patients were studied. Patients were assessed twice within one week using the FTHUE-HK, the upper extremity component of Fugl-Meyer movement assessment (FMA) and the modified Barthel index (MBI). The test-retest reliability and inter-rater reliability of the FTHUE-HK were thus quantified. The FTHUE-HK's validity was evaluated according to the correlation between the FTHUE-HK, FMA and MBI results. **Results** Significant correlations between the three assessments were demonstrated ($P \leq 0.01$). The intra- and inter-class correlation coefficients were 0.983 and 0.985 respectively. **Conclusion** The FTHUE-HK is a simple and useful assessment of the upper extremity function of stroke patients with good validity and reliability.

【Key words】 Function; Assessment; Stroke; Validity; Reliability

脑卒中是导致成人获得性功能障碍的主要原因,80%的存活者存在不同程度的功能损害,其中出现上肢功能障碍的患者有55%~75%^[1-2]。上肢功能的损害可以直接影响患者的日常生活能力,还影响到身体其他部位功能的发挥。而精确评定脑卒中患者上肢功能对评估病情、指导治疗、观察疗效、判断预后都极为重要。

偏瘫上肢功能测试(functional test for the hemiplegic upper extremity, FTHUE)是由Rancho Los Amigos医院治疗师Wilson, Baker, Craddock于1984年所设计发

行^[3],针对整个偏瘫上肢功能进行评定,后在2004年经香港作业治疗师方乃权等进行修改,并结合东方人种的生活和文化习惯汉化为香港版本(functional test for the hemiplegic upper extremity-Hong Kong, FTHUE-HK),发表于香港作业治疗杂志(Hong Kong Journal of Occupational Therapy, HKJOT)^[4],但汉化修改时,研究对象以香港本地人居多。本研究旨在分析FTHUE-HK评定本院42例脑卒中患者上肢功能的效度和信度,为该测试项目的推广应用提供依据。

资料与方法

一、研究对象

入选标准:①符合第4届全国脑血管疾病会议制订的脑卒中诊断标准^[5];②生命体征平稳,血压控制良好;③意识清楚,无认知功能障碍,简易精神状态检查(mini-mental state examination, MMSE)^[6]评分 ≥ 18

分;④单侧肢体瘫痪;⑤签署知情同意书。

排除标准:①合并严重的心、肺、肝、肾等重要脏器功能减退或衰竭及恶性肿瘤;②既往有肩周炎、关节炎等上肢疾病;③视野缺损;④各类失用症。

选取 2015 年 7 月至 2016 年 4 月在本院康复科门诊就诊和住院且符合上述标准的脑卒中患者 42 例作为研究对象,其中男 32 例,女 10 例;年龄(51.8±8.9)岁;平均病程(51.8±30.9)d;脑梗死 23 例,脑出血 19 例。

二、评定方法及评定指标

所有的评定均由具有丰富神经康复经验并熟练操作 FTHUE-HK 的治疗师完成。每位患者需进行 2 次评定。患者入选后,由 2 位治疗师一起进行 FTHUE-HK 的初始评定(一位主导治疗师,另一位观察,分别给出评定结果,结果记为 A1、B1)。由主导的治疗师分别采用 Fugl-Meyer 运动功能评定(Fugl-Meyer movement assessment, FMA)量表上肢部分和改良的 Barthel 指数(modified Barthel index, MBI)对患者的运动功能和日常生活活动能力进行评定。第 2 次评定,由主导治疗师在第 1 次评定后 1 周内完成,评定内容包括 FTHUE-HK、FMA 和 MBI,结果记为 A2。

1. FTHUE-HK 分级:分为 7 个等级^[2,4],每等级有 2 项活动进行测试,测试分级及测评项目详见表 1。每项活动在 3 min 内完成,有 3 次尝试机会。根据各等级要求,判定患者是否完成该级测试。观察结果描述为患者的上肢功能处于任一级别的例数。

表 1 FTHUE-HK 级别及其判定要求和评测项目

级别	判定要求	评测项目
1	肩关节、手肘及手部没有随意活动能力	没有反应
2	肩关节及手肘有少许随意活动能力	A 联合反应 B 患手放在大腿上
3	肩关节有共同屈曲模式成 30°~60°,及手肘成 60°~100°,手部能持松弛抓握达 3~5 磅(1 磅=0.4536 kg)负重	C 健手将患侧衣服塞入裤里时,患侧手臂能提起 D 提 1 kg 的袋子,持续 15 s
4	肩关节有>60°共同屈曲,及手肘成>100°;有少许手肘外展;及有 3~5 磅手部松弛抓握,并有少许侧面握握达 0.5~3.0 磅。	E 稳定瓶盖(用健手打开瓶盖) F 将湿毛巾拧干(健手扭两圈)
5	开始有联合强力的共同屈曲及外展;>5 磅手部抓握;超过 3 磅侧面握握及能随意放松	G 拿起并移动小木块 H 用勺子进食
6	有肩胛、手肘及手腕的个别控制;肩关节、手肘、手腕及手指有完全的外展能力;>5 磅手部抓握;超过 3 磅侧面握握;但协调动作比较差	I 提举盒子 J 用杯子喝水
7	上肢各肌肉有很好的个别操控及协调	K 用钥匙开锁 L1 操控筷子(患侧为利手) L2 操控夹子(患侧为非利手)

2. FMA 量表上肢部分:包括 9 个部分^[7],共 33 项:

①上肢反射活动;②屈肌协同运动;③伸肌协同运动;④伴有协同运动的活动;⑤分离运动;⑥正常反射活动;⑦腕稳定性;⑧手指活动;⑨协调能力与速度。评分分级为 3 级(0~2 分),总分 66 分。

3. MBI:包括 10 项日常生活自我照顾活动^[8]。评分时,每项根据患者的完成情况和自理程度分为 5 个等级,总分为 100 分。

四、统计学方法

使用 SPSS 19.0 版统计软件对所得数据进行统计学分析处理。采用 Spearman 相关系数分析方法,检验 FTHUE-HK 的效度;采用组内相关性分析方法,检验 FTHUE-HK 的信度。 $P<0.05$ 认为差异有统计学意义。

结 果

一、本组 FMA 和 MBI 评分及其 FTHUE-HK 分级分布

42 例患者的 FMA 量表上肢部分评分和 MBI 评分分别为(36.24±19.13)分和(64.59±21.56)分。42 例患者二次测评的 FTHUE-HK 等级分布数据详见表 2。

表 2 42 例患者 FTHUE-HK 各等级的二次测评结果[例(%)]

等级	FTHUE-HK 主评者第一次 A1	FTHUE-HK 另一评估者第一次 B1	FTHUE-HK 主评者第二次 A2
级别 1	2(4.8)	2(4.8)	2(4.8)
级别 2	7(16.7)	6(14.3)	6(14.3)
级别 3	10(23.8)	10(23.8)	10(23.8)
级别 4	9(21.4)	9(21.4)	9(21.4)
级别 5	6(14.3)	7(16.7)	6(14.3)
级别 6	5(11.9)	5(11.9)	6(14.3)
级别 7	3(7.1)	3(7.1)	3(7.1)

二、FTHUE-HK 的效度检验

FTHUE-HK 的结果与 FMA 总分高度相关,第一次评定(A1)的相关系数 $r=0.981$,第二次评定(A2)的相关系数 $r=0.982$, $P<0.01$;FTHUE-HK 的结果与 MBI 总分亦高度相关,第一次评定(A1)的相关系数 $r=0.892$,第二次评定(A2)的相关系数 $r=0.896$, $P<0.01$;FMA 总分与 MBI 总分亦高度相关,相关系数 $r=0.906$, $P<0.01$,详见表 3。

表 3 FTHUE-HK 各效度检验的 r 值

评定项目	FMA	MBI
FTHUE-HK (A1)	0.981*	0.892*
FTHUE-HK (A2)	0.982*	0.896*
FMA	-	0.906*

注: * $P<0.01$; -表示不存在

三、FTHUE-HK 的信度检验

重测组内信度:同一评估者的评定结果 A1、A2 之

间具有高度相关性 $ICC = 0.983$ 。组间信度:2 名评估者的评定结果 A1 和 B1 之间具有高度相关性 $ICC = 0.985$ 。FTHUE-HK 每级各项目结果之间具有高度相关性,详见表 4。

表 4 评估者内部和不同评估者 FTHUE-HK 结果的信度

级别	评测项目	评估者内部 ICC	不同评估者之间 ICC
级别 1	没有反应	1.0	1.0
级别 2	A 联合反应	1.0	1.0
	B 将手放在腿上	1.0	1.0
级别 3	C 患侧手臂提起	0.883	0.900
	D 提 1 Kg 的袋子	0.929	0.989
级别 4	E 稳定瓶盖	0.979	0.949
	F 拧干湿毛巾	0.953	0.893
级别 5	G 拿起移动小木块	0.957	0.954
	H 用勺子进食	0.947	0.889
级别 6	I 提举盒子	0.955	0.877
	J 用杯子喝水	0.856	0.791
级别 7	K 用钥匙开锁	0.911	0.883
	L 操控筷子或夹子	0.923	0.997

讨 论

简便实用、针对性强且具有较高信度和信度的上肢功能评定方法对开展脑卒中后遗症中上肢功能障碍的临床康复有重要意义。目前,常用于偏瘫患者上肢功能的评定方法很多,而关于不同评定方法的有效性和局限性的调查报告也日益增加^[9]。现有的评定方法,如 Brunnstrom 分期,周宁等^[10]认为其评估治疗效果的敏感度不高;吴媛媛等^[11]针对 Wolf 运动功能测试量表的研究发现,其更适用于评估强制性运动疗法改善上肢功能的情况;张晓莉等^[12]研究认为,以手功能为主的评定方法,如九孔柱测试等,不能很好地评定上肢近端的功能,且对手的精微动作要求过高,严重功能障碍的患者不能完成该类测试。另外,一些日常生活能力测试也不能反映患侧上肢的实际使用情况,因为大多数的日常生活活动能够用一侧完成^[4]。真正从整体出发评估脑卒中患者偏瘫上肢的活动能力及具体作业表现的评估量表,在国内的应用及研究相对较为少见。而 FTHUE-HK 的评估针对患者上肢整体活动表现,不局限于特定功能成分的缺失,能直观反映患者作业活动表现,对指导患者日常活动的康复具有极高的实际意义。

本研究表明,FTHUE-HK 对于评估偏瘫上肢功能敏感性高,其 7 个等级的划分,使治疗师对患者实际上肢功能情况的解读更为精准明了。此外 FTHUE-HK 利用作业活动,对上肢功能进行整体评估,直观地反映了患侧上肢的功能状态和其实际使用情况;结合作业分析,对临床治疗的开展有指导意义。本研究还发现,

临床使用 FTHUE-HK 量表时简单易行,耗时短,完成整个评定过程不超过 15 min;且不需要复杂的言语引导,患者的受教育程度对评定过程无影响,未出现患者不理解评定内容的情况,而且仅需较少的工具即可开展,成本小,利于临床推广。

本次对 FTHUE-HK 效度的研究中,以 FMA^[13] 和 MBI^[8] 作为标准效度。结果显示,FTHUE-HK 与 FMA 总分第一次评定的相关系数 $r = 0.981$,第二次评定的相关系数 $r = 0.982, P < 0.01$;FTHUE-HK 与 MBI 总分第一次评定的相关系数 $r = 0.892$,第二次评定的相关系数 $r = 0.896, P < 0.01$,提示 FTHUE-HK 的结果与 FMA、MBI 总分高度相关,表明使用 FTHUE-HK 评估患者上肢功能的有效性和准确性高,具有良好的效度。信度评价量表的稳定性和一致性。对 FTHUE-HK 的信度研究,分为重测信度和组间信度。结果显示,重测组内相关系数 $ICC = 0.983$,提示在 1 周内同一评估者使用 FTHUE-HK 的评估结果稳定性高;组间相关系数 $ICC = 0.985$,提示不同评估者使用 FTHUE-HK 的评估结果一致性高,FTHUE-HK 具有良好的信度,其测量结果稳定可靠。

FTHUE-HK 量表为脑卒中后上肢功能的评定提供了一种简便实用的方法,且具有良好的效度和信度,适于临床推广应用。尽管脑卒中后上肢功能的恢复不完全遵循这 7 个阶段,但该系统为临床作业治疗提供了一个参考框架^[4],且香港作业治疗师根据该系统建立了一个脑卒中后上肢功能的训练计划,每一级设有其治疗重点及训练活动。有关该训练计划促进脑卒中后上肢功能恢复的有效性,有待下一步继续研究。而本次研究未涉及 FTHUE-HK 评定脑卒中急性期和慢性期上肢功能是否存在差异,也有待进一步研究分析。

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· 外刊撷英 ·

Contralateral functional electrical stimulation in chronic hemiparesis

BACKGROUND AND OBJECTIVE Data suggest that cyclic neuromuscular electrical stimulation (cNMES) of the paretic wrist and finger extensors can improve upper extremity function in patients with subacute and chronic stroke. Contralateral controlled functional electrical stimulation (CCFES) is a new modality that enables the patient to actively open the paretic hand. The patient controls the stimulus in real-time by opening and closing the unaffected hand. This study compared the efficacy of CCFES to that of cNMES.

METHODS This parallel group study included patients at least six months out from a hemorrhagic or ischemic stroke, each of whom had unilateral finger extensor paresis. For each participant in the CCFES group, surface electrodes were positioned over the forearm finger and thumb extensors to produce hand opening. Using electrodes, pulses of electric current with a frequency of 35 Hz and amplitude of 40 mA were applied. The stimulus was programmed to increase the pulse duration for each electrode in proportion to the amount of opening of an instrumented glove worn on the contralateral nonparetic hand. The cNMES group was treated with the stimulator automatically and repetitively applying stimulus. A total of 20 sessions of therapist-guided, and 10 sessions of self-administered therapy were administered at 60 minutes per session over 12 weeks. The primary outcome measure was the Box and Block Test, a measure of manual dexterity.

RESULTS During the study, 72 patients completed the treatment. By six months, both groups had realized significant improvement in BBT scores, with the gain significantly greater in the CCFES group than in the cNMES group ($P=0.045$). Both groups improved on the upper extremity Fugl-Meyer, with no significant difference between groups. Those with the greatest gains were less than two years post-stroke.

CONCLUSION This study of patients with chronic, moderate to severe hand impairment after stroke found that 12 weeks of CCFES therapy improves manual dexterity more than does an equivalent dose of cNMES.

【摘自:Knutson JS, Gunzler DD, Wilson RD, et al. Contralaterally controlled functional electrical stimulation improves hand dexterity in chronic hemiparesis. A Randomized Trial. *Stroke*, 2016, 47:00-00. Doi: 10.1161/STROKEAHA.116.013791.】

Headaches as risk factors for stroke in the elderly

BACKGROUND AND OBJECTIVE Migraine is a well-established risk factor for stroke, specifically when accompanied by an aura. There is less evidence for the association between non-migrainous headaches and stroke. This study was designed to further explore the long-term relationship between headaches and the risk of stroke.

METHODS This study included 1119 community dwelling persons 65 years of age or older who were randomly invited to a half-day clinical examination. At baseline, data were obtained, including sociodemographics, lifestyle characteristics, health, personal and family medical history and medications. Health Conditions were noted, and a standardized neuropsychiatric interview was completed. During the initial examination, subjects were questioned about past and current headache episodes. Headaches were diagnosed as either non-migrainous (NMH) or migraine (MH). At baseline and follow-up, episodes of stroke were recorded.

RESULTS Lifetime MHs were diagnosed in 17.4%, and current MHs in 5.4%, of the subjects. In addition, lifetime NMHs were diagnosed in 11.4%, and current NMHs in 8.9%. Of the NMHs, 36.5% were classified as tension headaches. There were 73 incident strokes during follow-up, with 82.2% ischemic. Of baseline migrainers 1.9% had a stroke during follow-up, compared to 6.2% of those with an NMH, 3.6% of those with no lifetime history of headache, and 4.3% of those with past migraine or NMH. The 12-year risk of stroke was twice as high among patients with baseline NMHs as compared with unaffected subjects ($P=0.049$). No significant association was found between baseline MHs and subsequent stroke.

CONCLUSION This study of elderly individuals found that the risk of stroke is significantly higher among patients who have non-migrainous headaches, with no such association found among those with migraines.

【摘自:Norton J, Portet F, Gabelle A, et al. Are migraine and non-migrainous headaches risk factors for stroke in the elderly: findings from a 12-year cohort follow-up. *Eur J Neurol*, 2016, 23(9): 1463-1470.】