Screening for visual deficits at a rehabilitation unit early in the rehabilitation process after stroke

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Abstract

Stroke patients are not routinely screened for visual deficits despite recommendations on the importance of vision for safety and design of rehabilitation plans. The aim was to examine if it was feasible to expose rehabilitation patients to vision screening. Secondly, we aimed to examine the agreement between the vision screening and items from a neurological stroke screening tool specifically targeting vision and neglect.

Over a period of 6 months, patients arriving at a rehabilitation unit after having had a stroke were consecutively included. Data on aetiology, severity, and location of the stroke, time since the original admission, scores on the National Institutes of Health Stroke Scale (NIHSS), and results from a short screening/observation battery were registered. Cohen's kappa was calculated to examine the agreement between results from the screening/observation battery and NIHSS items.

Nighty-six percent of the patients were able to undergo screening of basic visual functions. Impairment was found in 52% of the patients, and 67% of these showed impairment in more than one function. Visual impairment occurred for all levels of stroke severity. Reduced distance visual acuity was found in 15% of all patients. Accordance between the screening/observation battery and NIHSS items varied between $\kappa = 0.36$ and $\kappa = 0.64$. Screening battery vs NIHSS items showed impairment in 31% vs. 21% of patients for oculomotor deficits, 31% vs. 34% for visual field deficits and 31% vs. 29% for neglect.

Results show that patients are assessable for basic visual functions early in the rehabilitation process. Items from the NIHSS cannot replace a dedicated vision screening tool because they exclude essential functions such as visual acuity, and oculomotor deficits may go undetected. Only the visual field assessment indicates substantial agreement and high sensitivity. Regarding stroke severity, agreement was substantial only in the severe group. In summary, we conclude that the NIHSS items cannot be recommended to replace systematic screening of visual function and neglect.

Keywords: visual impairment, stroke, vision screening, neurorehabilitation, NIHSS

Introduction

Impairment of visual function occurs in up to 60% of stroke survivors in the early subacute phase (Ali et al., 2013; Rowe, 2013; Rowe, Hepworth, et al., 2020). The importance of early visual assessment, preferably shortly after hospitalisation, is stressed by findings indicating that visual impairment increases the risk of falls, reduces participation in and the benefit of rehabilitation, and decreases independence in daily activities (e.g. dressing, manoeuvring wheelchairs, reading, using mobile phones) (Kerkhoff, 2000; Norup et al., 2016; White et al., 2015). Asking the patients themselves about visual impairment has been shown to be of limited value as answers do not provide reliable status descriptions due to the unawareness of deficits, denial of impairment, inability to describe impairment, or unspecific questions by staff (Berthold-Lindstedt et al., 2021; Falkenberg et al., 2020).

Despite the importance of visual functioning and recommendations in clinical guidelines, screening of functions is still not routinely applied in neither stroke nor rehabilitation units (NICE, 2013; Rowe et al., 2019; Schow et al., 2024). This may be due to time constraints, insufficient understanding of the impairment's impact, absence of brief and basic screening tools at rehabilitation sites, or uncertainty about which functions to prioritise when patients have complex needs and multiple impairments (Pollock et al., 2012; Rowe, Hepworth, Howard, Hanna, & Helliwell, 2022; Vancleef et al., 2022). Clinicians may further meet obstacles such as patients' fatigue, language impairment, postural difficulties, limited response capability, or cognitive impairment (Kerkhoff, 2000; Roberts et al., 2016; Schow et al., 2024; Wehling et al., 2024).

Warren (Warren, 1993a; 1993b) stressed the importance of extensive assessment of visual function after brain injury. Yet, she suggested that assessing basic visual skills, i.e. oculomotor function, visual fields and visual acuity, prior to higher level functions such as visual scanning, attention, pattern recognition, and visual memory, since deficits in basic skills could affect higher level functions (de Haan et al., 2020; Warren, 1993a; 1993b). This bottom-up approach could initiate referral to vision specialist to verify diagnosis and instigate treatment.

Upon admittance to stroke or rehabilitations units, patients are routinely examined for neurological deficits. A frequently used screening tool is applied; the National Institutes of Health Stroke Scale (NIHSS) (Brott et al., 1989), which contains items assessing visual domains, i.e. horizontal gaze disorders and visual field deficits. A third item assesses neglect/inattention, characterised by inattention towards the contra-lesional hemisphere, independent of the direction of gaze. Using the NIHSS, Ali et al. (2013) found that visual impairment was reported in 61% of stroke patients in the acute phase, with 28% still showing impairment at 30 days and 21% at 90 days follow-up. The NIHSS has been criticised

for not being usable as the only vision screening tool due to problems in detecting impairment of central vision and eye movement disorders (Hanna et al., 2017). Existing studies often report NIHSS findings focusing on location of the stroke (left versus right hemisphere, posterior versus anterior) or on sex differences (Barrett et al., 2007; Lyden et al., 1999; Tao et al., 2012). Regarding visual impairment, these studies either focus on one item or combine items based on factor analysis. Studies comparing NIHSS scores with subtests from more comprehensive screening tools such as the Brain Injury Visual Assessment Battery for adults (biVABA) (Warren, 2006), which is frequently available in rehabilitation settings, are still missing.

The aim of this study was to explore if it is feasible to expose patients admitted to inpatient rehabilitation to a short vision screening battery, including assessment of visual acuity, visual field and oculomotor functions. Screening of neglect/inattention was included due to the high occurrence in stroke patients and the overlap of symptoms with visual field deficits (Nyffeler et al., 2017; Ringman et al., 2004). The second aim was to analyse the agreement between the short vision screening/observation battery with results from the NIHSS. The results may help clinicians to decide which patients should be exposed to extensive assessment and referral to vision specialists as suggested by guidelines.

Methods

Participants

Patients admitted from two hospitals with acute stroke units were consecutively included after admission to the Department of Physical Medicine and Rehabilitation at the Haukeland University Hospital Bergen, Norway. Inclusion criteria were age ≥ 18 years and the ability to be awake and sit upright (wheelchair/chair) for approximately 20 minutes. Informed consent was obtained from the patient him-/herself or from a next of kin in cases where the patient's ability to communicate or their cognitive ability was reduced. The study was approved by the Western Regional Ethics Committee (REK 2018\903) and was conducted in accordance with the declaration of Helsinki (World Medical Association, 2018).

Measures

Medical data

Demographical and medical data were collected from each patient's medical journal, including age and gender, and aetiology, location and severity of stroke. Variables regarding visual function were registered, including ptosis, glaucoma, cataract, diabetic retinopathy, macular degeneration, strabismus, and use of visual aids/glasses/lenses before the stroke. The NIHSS (Brott et al., 1989) was scored upon arrival to the rehabilitation unit by the physician in charge.

Time of assessment

The time interval between stroke and vision screening was registered.

Vision screening procedure

Three short tests from the basic level of Warren's hierarchical model of visual-spatial abilities (Warren, 2006) were chosen, i.e. distance visual acuity, oculomotor control, and visual fields. Two experienced occupational therapists conducted the vision screening, which took approximately 15–20 minutes.

Vision screening battery

Visual acuity

Visual acuity was assessed using the Intermediate Acuity Test Chart from the biVABA (Warren, 2006). The patient sat one metre from the test chart wearing his/her own glasses, if indicated, and read the numbers on the chart aloud. The outcome was determined by the Snellen and metric fractions for the last row in which the patient accurately identified at least three out of five letters. Patients with aphasia were tested with the LEA-acuity test with symbols and pointed out the corresponding symbol on a sheet (Hyvärinen et al., 1980). Low vision was defined according to WHO's standards (Snellen acuity less than < 20/60) (Steinmetz et al., 2021).

Oculomotor control

Oculomotor control was assessed using the Binocular Smooth Pursuit Eye Movements from the biVABA (Warren, 2006). The penlight was held vertically, and the patient was instructed to focus on the light at the tip of the penlight. The penlight was moved slowly and smoothly in an arc through the nine cardinal directions of gaze (left, right, up, down and 45° diagonals) while maintaining approximately 40 cm distance from the patient. The results were recorded as "normal" when the patient was able to follow the pen in all directions, or "impaired" when the patient had difficulties following the pen or had a deviated eye position for more than approximately 2 seconds.

Visual field test

The patient sat vis-à-vis a staff member and was requested to focus on the person's face. A second staff member was positioned behind the patient. A red ball (the size of a tennis ball) was moved from behind the patient's head into his/her visual field at eye height until a 70° angle from fixation was reached (according to an angle meter fixed in the ceiling). The patient was instructed to indicate (by saying "now" or raising his/her hand) when he/she detected the ball. Three attempts for each side were registered. The results were recorded as "normal" (responding all three times to either side) or "visual field deficit" (VFD) when the ball was not detected two or more times (either left or right).

Neglect/visual inattention

Since brain injury often causes visual neglect co-occurring with visual deficits, and due to the timely assessment after admission and occurrence of hemiparesis of upper extremities, the presence of neglect was based on occupational therapists' observations. Neglect/inattention in at least two daily activities (e.g. dressing, eating, personal hygiene, colliding with/into objects) in addition to gaze deviation had to be observed for the presence of neglect to be registered.

National Institutes of Stroke Scale

The NIHSS is a systematic assessment tool providing a quantitative measure of stroke-related neurologic deficit. In this study, a 13-item Norwegian version was used to assess levels of consciousness, eye movements, visual-fields, motor strength (face, arm, leg), ataxia, sensory loss, language, speech, and neglect (Thomassen et al., 2011). Stroke severity was indicated by the fol-

lowing intervals: 1–4 = minor, 5–14 = moderate, 15–24 = severe, and ≥ 25 = very severe stroke.

For the analysis in this study, three items from the NIHSS relating to visual deficits and neglect were used. These comprised: *Best gaze* (item 2; Eyes open – patient follows examiner's finger or face; 0 = normal, 1 = partial gaze palsy, 2 = forced deviation), *Visual fields* (item 3: introduce stimulus/threat to patient's visual field quadrants; 0 = no visual field loss, 1 = partial hemianopia, 2 = complete hemianopia, 3 = bilateral hemianopia [blind]), and *Inattention/Neglect* (item 11; using Donders confrontation test, the patients covers his/her one eye with his/her hand). The examiner sits directly across from the patient and asks the patient to direct his/her gaze to the corresponding eye of the examiner. The examiner moves a target (finger/hand) from outside the visual field slowly into a central position until the patient reports seeing the target. Each eye is tested independently. Scores: 0 = no neglect, 1 = visual neglect, 2 = neglect occurred in visual and one other modality.

Data analysis

Analysis was conducted using IBM SPSS Statistics (Version 27). Descriptive statistics (Mean [*M*], Standard deviation [*SD*] and percentage [%]) were used to describe the sample characteristics and frequencies. Fisher's Exact Test was used to examine categorical data and Kruskal-Wallis tests were used for comparisons of continuous data. Cohen's kappa measure of agreement was calculated to evaluate the agreement between results from three items from the NIHSS and the vision screening/observation battery. The values of agreement have been defined as < 0.2 mild, 0.21–0.4 fair, 0.41–0.6 moderate, and 0.61–0.8 substantial. All analyses were two-tailed, and the alpha level was set at $p < 0.05$.

Results

In total, 52 patients were included. The average age was 67 years ($SD = 9$; range 49–83 years) and 56% of the sample were men. In 46% of the patients the lesion was located in the right hemisphere, in 50% it was in the left hemisphere, and 4% had bilateral lesions. For 77% of the patients the stroke was ischaemic and for 23% it was haemorrhagic. Thirty-five percent ($n = 18$) presented with language difficulties (aphasia and/or verbal apraxia). Based on NIHSS scores, 48% ($n = 25$) had a minor, 35% ($n = 18$) a moderate, and 17% ($n = 9$) a severe stroke. Sample characteristics are presented in Table 1.

Table 1: *Sample characteristics and clinical variables upon admission to the rehabilitation unit.*

		Range
Age (years), *M* (*SD*)	66.7 (9.1)	49–83
NIHSS total admission rehabilitation, *M* (*SD*)	7.6 (6.5)	0–24
Length of stay at acute ward (days), *M* (*SD*)	12 (9)	3–55
Time between ictus and visual screening/rehabilitation (days), *M* (*SD*)	22 (11)	6–61
Sex, *n* (male/female)	34/18	
Type of stroke, *n* (ischaemic/haemorrhagic)	40/12	
Location, *n* (left/right/bilateral)	26/24/2	
Aphasia, *n*	18	
Eye disease before admission, *n*	12	
Use of visual aids (glasses, contact lenses) before injury, *n*	47	

Screening visual functioning and neglect

Feasibility of assessment with vision screening battery

Fifty patients (96%) were able to undergo the complete vision screening. Two were not assessed with the visual acuity test, one who was not able to respond to stimulus material due to severe speech difficulties and one who expressed severe diplopia and was not able to focus on the Snellen chart. The timepoint for vision screening varied between 1 and 68 days ($M = 21$, $SD = 11$, Median = 20) after the stroke. Sixty-four percent were screened within the first week after arrival at the rehabilitation unit, all were screened within the first 12 days.

Vision screening results

Of the sample, 52% ($n = 27$) of patients showed deficits on any of the tests from the vision screening battery and the neglect identification. Fifteen percent of the sample ($n = 8$) had low vision (visual acuity < 20/60), 31% ($n = 16$) showed oculomotor deficits, and 31% ($n = 16$) had visual field deficits. Visual neglect occurred in 29% ($n = 15$). Analysis indicated no significant sex differences and no differences regarding lesion site for visual impairment. For patients registered with neglect, the stroke was more often in the right than in the left hemisphere ($\chi^2 = 13.9$; $p < 0.01$). Grouped by stroke severity, 48% ($n = 12$) with a minor, 44% ($n = 8$) with a moderate and 77% ($n = 7$) with a severe stroke demonstrated visual impairment. Sixty-seven percent of the patients demonstrated impairment in more than one function (see Figure 1). Analysis indicated that strokes with greater severity were more likely to cause some form of visual impairment ($H = 5.48$ [2], $p < 0.07$).

NIHSS score on three items

According to the three NIHSS items, 54% of the patients had deficits in any of the three selected items. Approximately 44% ($n = 23$) were scored to have visual field deficits, 37% ($n = 19$) had inattention/neglect, and 21% ($n = 11$) showed gaze deficits. Nineteen percent ($n = 10$) demonstrated impairment on one item, 23% ($n = 12$) on two, and 12% ($n = 6$) on all three items.

Agreement of NIHSS items and vision screening/observation battery

Table 2 shows the number of patients with impairment on the vision screening/observation battery and the NIHSS items for the three stroke severity groups.

The agreement for individual items and stroke severity groups are shown in Table 3. The overall agreement between NIHSS and the vision screening/observation battery had a kappa value of 0.5. This related to both high false negatives and false positives. Sensitivity was 77% and specificity 72%. For the individual items of the two methods, the highest level of agreement occurred for the visual field assessment ($\kappa = 0.64$). Neglect revealed a fair agreement ($\kappa = 0.53$). The lowest level of agreement occurred for oculomotor deficits ($\kappa = 0.36$). This related to a high number of false negatives, which means that patients did not show impairment on the NIHSS item, whereas they did on the vision screening/observation bat-

tery. The visual field assessment and the neglect assessment revealed a high number of false positives, which means the patients were scored as impaired with the NIHSS assessment but not with the vision screening battery.

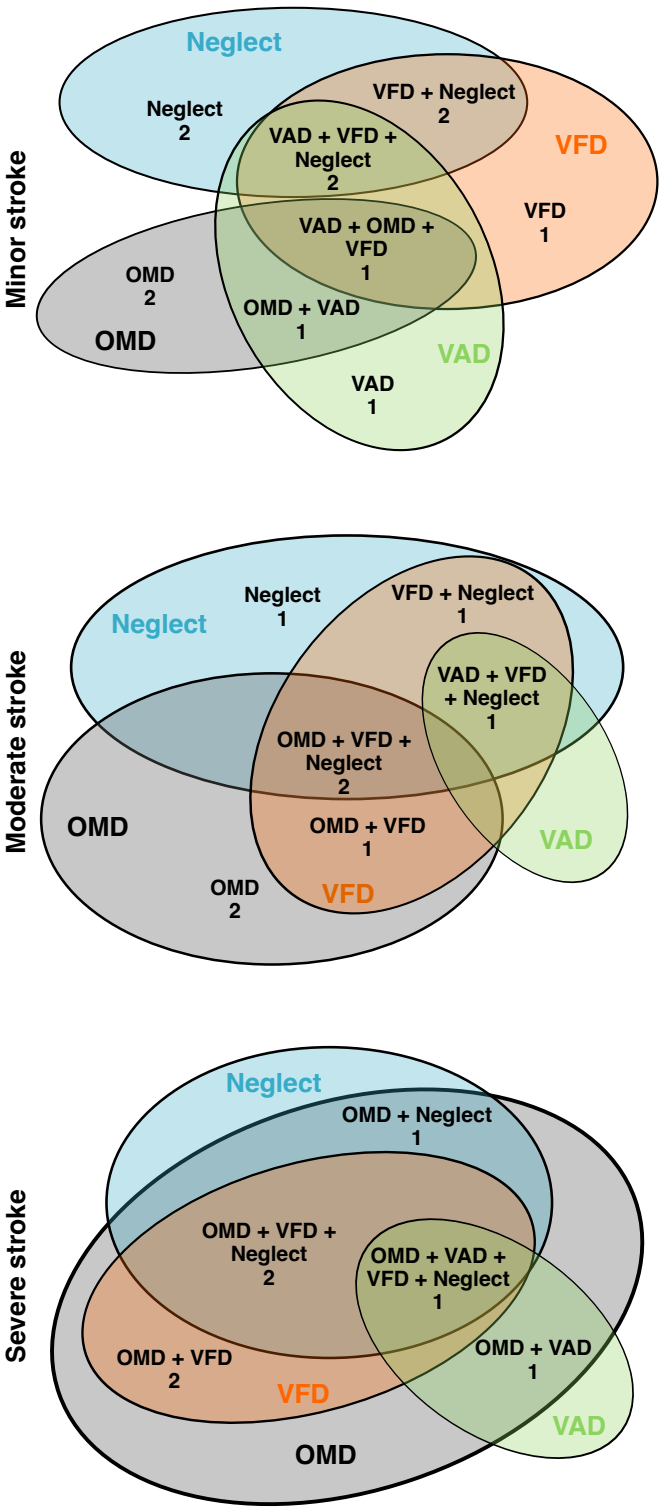

Figure 1: *Combination of visual deficits based on the visual screening/observation battery. VAD = Visual acuity deficit; OMD = Oculomotor deficit; VFD = Visual field deficit.*

Table 2: *Agreement between the visual screening/observation battery (VS/OB) and NIHSS items grouped by stroke severity.*

	Minor stroke (n = 25)		Moderate stroke (n = 18)		Severe stroke (n = 9)	
	NIHSS items	VS/OB	NIHSS items	VS/OB	NIHS items	VS/OB
Visual acuity deficit	–	5	–	1	–	2
Oculomotor deficit	1	4	3	5	7	7
Visual field defect	8	6	7	5	8	5
Neglect	4	6	8	5	7	4

Numbers refer to the number of patients.

For the stroke severity group, analysis revealed low agreement in the group with moderate severity ($\kappa = 0.24$) and fair agreement in minor and severe groups. In the minor stroke group reduced agreement was due to false negatives, whereas in the moderate stroke group low agreement was due to false positives. Sensitivity and specificity varied between 66% and 92%.

Table 3: *Summary of agreement between NIHSS and vision screening/observation battery for individual components and stroke severity (false positives and negatives, κ, sensitivity and specificity, and positive- and negative-predictive values).*

	Agreement	False neg.	False pos.	Kappa [95% CI]	Sens.	Spec.	PPV	NPV
Impairment	39	6	7	0.50 [0.26, 0.74]	77%	72%	75%	75%
Oculomotor deficit	39	9	4	0.36 [0.09, 0.63]	44%	89%	64%	78%
Visual field deficit	43	1	8	0.64 [0.43, 0.85]	94%	77%	65%	78%
Neglect	41	3	8	0.53 [0.29, 0.77]	80%	60%	60%	80%
Minor stroke	20	4	1	0.59 [0.28, 0.90]	66%	92%	88%	75%
Moderate stroke	11	2	5	0.24 [−0.18, 0.66]	75%	50%	54%	71%
Severe stroke	8	0	1	0.61 [0.06, 1.00]	100%	50%	88%	100%

Discussion

The aim was to examine the feasibility of a short vision screening/observation battery and to investigate the agreement of results from this battery with items from the NIHSS, a common neurological screening instrument that contains items of visual function and neglect.

Our results demonstrate that most patients were able to undergo vision screening using established methods in rehabilitation, i.e. subtests from the biVABA. Impaired visual function and neglect/inattention were found in about half of all patients using a vision screening/observation battery. Two thirds of these patients demonstrated deficits in more than one visual function. The agreement of results from the vision screening/observation battery and the NIHSS varied between fair and substantial. Likewise, sensitivity and specificity for individual items and stroke severity groups varied.

Our results, showing that vision screening was viable in 96%

of the patients admitted to rehabilitation units, even those with severe stroke or with aphasia, are notable and important for clinicians working in rehabilitation. More than half of the patients in our sample were screened within the first week after arriving at the rehabilitation unit, and all were assessed within the first fortnight. Due to this early screening, patients could be referred to vision specialists as soon as they were considered capable of undergoing an extensive assessment. Safety issues at the unit could be addressed, potentially preventing falls or bumping into objects. Moreover, the screening results could be considered in the interdisciplinary rehabilitation plan both at the inpatient unit and at follow-up after discharge. Although starting visual training is not recommended until after consultation with vision specialist (Roberts et al., 2016), for some patients the process of becoming aware of their visual impairment, learning about the consequences, and compensating for the deficit may be started immediately after the screening. Only two patients were not able to undergo distance acuity screening. One of these patients had aphasia which is often a barrier in assessments. The oculomotor and visual field assessments had instructions that were intuitive or could be supported by signs, which may have made them easier to perform than the visual acuity test.

The vision screening/observation battery indicated that more than half of the sample had some kind of visual impairment or neglect, and that most patients have impairment in more than one visual function. We found a trend indicating that the more severe a stroke was, the more likely it was to cause visual impairment. This is in accordance with earlier reports (Rowe, Hepworth, Howard, Hanna, et al., 2020) and the missing statistical significance may be explained by a small group size for patients with severe stroke.

The agreement between the NIHSS items and results from the screening battery varied considerably. Lowest agreement was found for the oculomotor item. Analysis revealed low sensitivity and a high number of false positives. This is important to consider. Eight patients who showed oculomotor impairment on the screening/observation battery were overlooked by the NIHSS. The shortcoming of detecting such impairment should be avoided, regardless of whether it occurs as the only impairment or in combination with others. Oculomotor function is highly important for all visual functioning and since these functions may improve through training (Watabe et al., 2019) the NIHSS item is not sufficient to satisfactorily assess this function and an extended screening as performed in the screening battery seems indicated.

The agreement for neglect and visual field varied between moderate (neglect) and substantial (visual field). The detection of VFD after stroke is important since it impacts grooming, feeding, work and family life, and is associated with fear, loss of confidence and avoidance (Hazelton et al., 2019; Rowe, 2017). Despite a high sensitivity for the visual field item (94%), specificity was somewhat low (77%) and for the neglect item, both sensitivity and specificity were low (≤ 80). For both items, there was a high number of false positives, indicating that impairment was found on the NIHSS item but not on the screening battery. Of these false positives, four showed impairments on a combination of other functions in the screening battery including neglect, oculomotor and visual acuity. One showed only a visual acuity deficit. This underlines the importance of further referral and clarification of multiple conditions through an orthoptic examination.

It is noteworthy that in both the NIHSS and the screening battery symptoms of visual field deficits and neglect co-occurred in almost half of the patients. Since neglect and visual field deficits are functionally distinct disorders, with differing lesion localisation, observable behaviour and prognosis (Halligan et al., 1990; Mueller-Oehring et al., 2010; Ting et al., 2011), comprehensive assessment and differential diagnosis are indispensable. This underlines that screening must be followed up with more extensive assessment which may be challenging in the early phase after stroke (Karnath, 2001; Karnath et al., 2001; Kerkhoff & Schindler, 1997; Mueller-Oehring et al., 2010).

Our final analysis examining the agreement between the vision screening/observation battery and the NIHSS regarding stroke severity showed considerable variation. Overall, agreement was low, and so were sensitivity and specificity with a high number of both false negatives and false positives. Agreement was substantial and sensitivity high only among the patients whose stroke was severe. In this case the NIHSS items could seem sufficient to determine impairment. Yet, the combination of impaired functions varied and thus the screening battery should be the preferred method of assessment. In the minor stroke group, agreement was high moderate, yet sensitivity was low, with a considerable number of false negatives.

In sum, we conclude that the NIHSS items for screening are not recommendable. The analysis revealed a considerable number of both false negative and false positives. The clinical consequences are of importance in that a false negative may mean that a patient is not referred for further assessment and subsequent treatment in a timely fashion. A false positive test may result in unnecessary further assessment for patients with limited capacity. The balance between these two types of errors needs consideration. In a rehabilitation setting like ours, repeated screening would be one way to collect consistent results since confounding factors such as fatigue, cognitive and communication disorders, or paresis may affect assessment.

We acknowledge that there are limitations to this study. We are aware that both the NIHSS and the tests from the biVABA are screening instruments and cannot compensate for detailed examination by vision experts. We argue that the methods enclosed in the biVABA are quite similar to validation tools such as Competence, Rehabilitation Of Sight after Stroke (KROSS) (Falkenberg et al., 2024) or Vision Impairment Screening Assessment (VISA) (Rowe, Hepworth, et al., 2020) and that it is a systematic method of screening for vision impairment in stroke patients. We chose to include screening of four functions but we are aware that there are many others of importance (Rowe, Hepworth, Howard, Hanna, & Currie, 2022). We based our approach on Warren's model for vision rehabilitation which is well-known in rehabilitation settings in Norway (Warren, 1993a; 1993b). Increased focus on interdisciplinary vision rehabilitation and functional vision including user perspectives may lead to changes in approaches and assessment of stroke patients in the future (Roberts et al., 2016; Rowe, Hepworth, Howard, Hanna, & Helliwell, 2022).

Conclusion

Screening of basic visual functions early in the rehabilitation process is feasible in most stroke patients. A systematic approach in the form of a short screening battery helps the interdisciplinary team and patients to differentiate type of impairment and potential impact on visual function. This study has found that a large proportion of stroke patients show multiple deficits and indicates that visual function should be considered along with language, speech, and motor disorders during assessment and rehabilitation after stroke. The use of a screening instrument in all patients is preferred compared to relying on items from the NIHSS.

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Declaration of interest

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Screening for visuelle vansker tidlig i rehabiliteringsprosessen etter hjerneslag

Sammendrag

Pasienter med hjerneslag blir ikke rutinemessig screenet for visuelle vansker til tross for anbefalinger om viktigheten av syn for sikkerhet og utarbeidelse av rehabiliteringsplaner. Målet med studien var å undersøke om det er mulig å gjennomføre synsscreening hos rehabiliteringspasienter. Videre ønsket vi å undersøke overenstemmelsen mellom resultatene fra synscreeningen med testledd om syn og neglekt fra et nevrologisk screeningsverktøy.

Over en periode på seks måneder ble pasienter med hjerneslag innlagt på en rehabiliteringsenhet fortløpende inkludert i studien. Data om årsak, alvorlighetsgrad og lokalisering av hjerneslaget, tid siden første innleggelse, skår på National Institutes of Health Stroke Scale (NIHSS), og resultater fra en kort screening-/observasjonsbatteri ble samlet inn. Cohens kappa ble beregnet for å vurdere overensstemmelse mellom resultatene fra screeningen-/observasjonsbatteriet og NIHSS-leddene.

Nittiseks prosent av pasientene var i stand til å gjennomgå screening av grunnleggende visuelle funksjoner. Synsvansker ble funnet hos 52% av pasientene, og 67% av disse viste nedsatt funksjon i mer enn én visuell funksjon. Visuelle vansker forekom for alle alvorlighetsgrader av hjerneslaget. Redusert visus (avstand) ble registrert hos 15% av alle pasientene. Overensstemmelsen mellom screeningen-/observasjonsbatteriet og NIHSS-leddene varierte mellom $\kappa = 0,36$ og $\kappa = 0,64$. Screeningbatteriet sammenlignet med NIHSS-leddene viste nedsatt funksjon hos 31% vs. 21% av pasientene for øyemotoriske vansker, 31% vs. 34% for synsfeltutfall, og 31% vs. 29% for neglekt.

Resultatene viser at pasienter kan screenes for grunnleggende visuelle funksjoner tidlig i rehabiliteringsprosessen. Ledd fra NIHSS kan ikke erstatte et dedikert synsscreeningsverktøy, fordi vesentlige funksjoner som synsskarphet er utelukket, og øyemotoriske vansker kan forbli uoppdaget. Kun kartleggingen av synsfeltet viser betydelig overensstemmelse og høy sensitivitet. Alvorlighetsgraden av hjerneslaget hadde kun betydning for overensstemmelsen i gruppen med alvorlig hjerneslag. Samlet sett konkluderer vi at NIHSS-ledd ikke kan anbefales som erstatning for systematisk screening av visuelle funksjoner og neglekt.

Nøkkelord: visuelle vansker, slag, synsscreening, NIHSS, nevrorehabilitering

Screening dei deficit visivi in una unità di riabilitazione nelle fasi precoci del percorso riabilitativo post-ictus

Riassunto

I pazienti colpiti da ictus non vengono sottoposti sistematicamente a screening per i deficit visivi, nonostante le raccomandazioni sull'importanza della visione per la sicurezza e per la pianificazione della riabilitazione. L'obiettivo dello studio era verificare la fattibilità di effettuare uno screening visivo su pazienti in riabilitazione. In secondo luogo, si mirava ad esaminare il grado di concordanza tra i risultati dello screening visivo e alcuni elementi di uno strumento neurologico di valutazione dell'ictus (NIHSS) specificamente rivolti a visione e neglect. Nel corso di 6 mesi, i pazienti che giungevano in una unità riabilitativa dopo un ictus sono stati inclusi. Sono stati raccolti dati sull'eziologia, gravità e sede dell'ictus, tempo trascorso dalla prima ospedalizzazione, punteggi alla scala National Institutes of Health Stroke Scale (NIHSS), e risultati di una breve batteria di test di screening/osservazione. L'indice kappa di Cohen è stato calcolato per esaminare l'accordo tra i risultati della batteria di screening/osservazione e gli elementi del NIHSS.

Il 96% dei pazienti è stato in grado di sottoporsi allo screening delle funzioni visive di base. Nel 52% dei pazienti è stato rilevato un deficit visivo e il 67% di questi mostrava alterazioni in più di una funzione. I deficit visivi si sono riscontrati a tutti i livelli di gravità dell'ictus. Una riduzione dell'acuità visiva da lontano è stata osservata nel 15% dei pazienti. La concordanza tra la batteria di screening/osservazione e gli item del NIHSS variava tra □ = 0.36 e $\kappa = 0,64$. Il confronto tra batteria di screening e NIHSS ha mostrato alterazioni nel 31% contro 21% dei pazienti per i deficit oculomotori, 31

I risultati indicano che i pazienti possono essere valutati per le funzioni visive di base nelle fasi iniziali del processo riabilitativo. Gli elementi del NIHSS non possono sostituire uno strumento dedicato allo screening visivo, poiché escludono funzioni essenziali come l'acuità visiva, e i deficit oculomotori possono non essere rilevati. Solo la valutazione del campo visivo mostra una concordanza sostanziale e un'elevata sensibilità. In relazione alla gravità dell'ictus, l'accordo è stato sostanziale solo nel gruppo con forme gravi. In sintesi, si conclude che gli elementi del NIHSS non possono essere raccomandati come sostituti di uno screening sistematico della funzione visiva e del neglect.

Parole chiave: deficit visivo, ictus, screening visivo, neuroriabilitazione, NIHSS