

Truncal Ataxia in the Differential Diagnosis of Acute Vestibular Syndrome

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Abstract

Patients with vertigo represent a diagnostic challenge. Physicians require a thorough knowledge both of the diseases that cause it, and of the correct physical examination and interpretation. This is even more important in the case of acute vestibular syndrome, in which we must differentiate between benign disorders and those that may compromise the patient's life, and we must do this in the most accurate way and in the shortest time possible. In recent years the diagnostic process has been under review so as to select those elements that allow us to correctly diagnose central and peripheral lesions. The greatest attention has been paid to the signs derived from the vestibulo-ocular connections, leaving aside those derived from vestibulo-spinal connections. We believe that the latter, especially truncal ataxia, may be helpful in those cases in which, due to their difficulty, vestibulo-ocular signs do not allow us to correctly interpret the clinical picture.

Keywords: Acute Vestibular Syndrome; Truncal Ataxia; Babinski's Flexor Asynergy; HINTS

Introduction

The evaluation of a patient who consults due to vertigo is a diagnostic challenge. In a very short time we must establish if the symptoms are caused by a benign disorder or by a disease that may put the patient's life at risk.

In recent years we have witnessed great advances in the evaluation of patients with acute vestibular syndrome, not only as regard diagnostic technology but also as recognizing the importance of the patient's report and physical examination. It has also been shown that physical examination is often more accurate than neuroimaging in the diagnosis of an injury at the level of the central vestibular system during the first hours of the event [1].

Since 2009 there is a new paradigm available for the evaluation of patients with acute vestibular syndrome: the HINTS protocol [1]. This protocol focuses on evaluating the presence or absence of altered head impulse test, the characteristics of nystagmus and the presence or absence of ocular tilt (test of skew). The presence of a normal head impulse test and / or a nystagmus with central characteristics and / or the presence of skew force us to suspect a central lesion as the cause of the symptoms.

This has improved diagnostic accuracy. Although its application seems simple, in practice it is not so, since it requires an extensive training in order to master the diagnostic maneuvers, in addition to the difficulties that arise when examining a patient who suffers from acute symptoms which cause him an intense discomfort that interferes with physical examination [2,3].

There is a large repertoire of signs that one may examine in a patient with vertigo, and several studies have evaluated them in the

background [1,4], but in others they have been the main objective [5]. One of them is truncal ataxia. Lee., *et al.* [4] defined it as a loss of motor coordination that makes walking difficult, and established three grades: Grade 1, the patient has mild to moderate instability in the standing position, but can walk without assistance; Grade 2, severe instability, but cannot roam without assistance; Grade 3, the patient is unable to be incorporated. Babinski [6] many years ago evaluated it by asking the patient in supine position to get up without using his arms, and if the patient was unable to do so, he called it flexor asynergy, which was observed in both cerebellar syndrome and hemiparesis due to lesions of the pyramidal pathway. It has also been evaluated with the Romberg test and the Tandem march.

Discussion

When examining the vestibular system, we test the vestibulo-spinal and vestibulo-ocular connections, both controlled by the cerebellum. Therefore, what we find in a patient with vertigo depends on the alterations in these connections or on the control exerted on them by the cerebellum.

In the HINTS paradigm we evaluate: head impulse test, nystagmus and ocular tilt, and these are alterations of vestibulo-ocular connections and the cerebellar control over them. This protocol has demonstrated high sensitivity (100%) and specificity (96%) when applied to patients with acute vestibular syndrome by trained personnel, even surpassing the neuroimaging in the diagnosis of acute stroke that presents with vertigo as an isolated symptom may be the only manifestation in up to 20% of cases of stroke in vertebrobasilar territory - in the first 48 hours of the onset of the condition. But some have pointed out the difficulty of its application, either because they do not have physicians with specific training in neurotology, or because of the technical difficulties caused by the dramatic nature of the picture that produces such discomfort in the patient that makes it impossible to perform the diagnostic maneuvers as to interpret them [2,3,5].

Lee., *et al.* [4] published a study in 2016 evaluating the symptoms and signs of stroke in vertebrobasilar territory, and he found that Grade 1 truncal ataxia was present in 29% of his patients, Grade 2 in 4% and Grade 3 in the 65% of cases.

In the work of Kattah., *et al.* [1], which laid the foundations for the HINTS protocol, severe truncal ataxia, defined as the inability of the patient to sit from the unassisted decubitus position, was present in 34% of patients with a central vestibular syndrome, and absent in those patients for whom the origin of their vestibular symptoms was a peripheral lesion.

In 2016, we published [5] a retrospective case-control study, where we set out to evaluate whether truncal ataxia, as defined by Lee., *et al.* [4] criteria was useful in the differential diagnosis of acute vestibular syndromes. We found that the presence of Grade 2 - 3 truncal ataxia has a sensitivity of 92.9% and a specificity of 61.1% to discriminate between central and peripheral lesions. No patient with a central lesion was free from ataxia, so its absence leads us to the diagnosis of a peripheral vestibular syndrome. No patient with vestibular neuritis presented Grade 3 ataxia, so their finding would confirm a brainstem injury. We also found that Babinski’s flexor asynergy was present in all patients with Grade 3 ataxia, and in all patients with Grade 1 stroke and ataxia. In this study, the combination of two signs, such as Grade 2 - 3 truncal ataxia with the characteristics of a central type nystagmus obtained a 100% sensitivity and a 61.1% specificity, so that no patient with a central vestibular syndrome would to be classified as a patient with peripheral lesion (Table).

	Sensitivity %	Specificity %
Ataxia 1	7.1	45.8
Ataxia 2	26.2	61.1
Ataxia 3	66.7	100
Ataxia 2 - 3	92.2	61.1
Ataxia 2 - 3 + Direction changing Nystagmus	100	61.1
Flexor asynergy +	92.9	100

Table: Sensitivity and Specificity of the evaluated Signs

One has to be careful when interpreting truncal ataxia. When patients with vestibular neuritis wander they often deviate and / or fall to the injured side, which can be furthered evidenced by the Romberg test [2]. However, generally speaking they are able to stand up, sit down and wander without help [2].

Although our data were retrospectively collected and is therefore subject to important biases, we believe that this is a study that presents vestibulo-spinal signs as potentially useful when evaluating a patient with vestibular syndrome. These signs have the advantage of being easy to evaluate and they do not require too much training for their correct interpretation.

Conclusion

In recent years, the way to approach patients with acute vestibular syndrome has improved. What is important is to be able to discard with a high level of confidence a central injury that could compromise the patient's life as the cause of his symptoms.

We have been able to make a differential diagnosis between central and peripheral causes in a few minutes, with a higher level of accuracy, and with even better sensitivity during the first 48 hours with only the physical examination as compared to the neuroimaging.

We believe that a systematic study of vestibulo-spinal alterations may be helpful in the diagnosis of these patients, mainly because of its relatively easy application and interpretation. Among these signs we should highlight truncal ataxia as the one most studied. Although more studies are necessary to evaluate and confirm the clinical usefulness of trunk ataxia and other vestibulo-spinal signs, they are very promising from the clinical point of view.

Conflicts of Interest

None to be disclosed.

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