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Research Article

The clinical uses of vinpocetine: An educational article and expert opinion

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Abstract:

Vinpocetine (Ethyl-apovincaminate) is a derivative of vincamine which is an alkaloid compound. It has been used for years in the treatment of chronic cerebral disorders in few countries. and its beneficial effects have been attributed mostly to an improved blood flow and metabolism of the affected brain tissues. The aim of this paper is to provide an overview of the possible clinical uses of vinpocetine that are supported by scientific evidence.

Expert opinion: The current evidence-based expert opinion suggests that vinpocetine as a monotherapy is unlikely to be beneficial in any disorder. However, there is some evidence suggesting that the use of vinpocetine as adjunctive therapy in patients with chronic cerebrovascular ischemia can have a beneficial effect on cognitive functions and the quality of life.

Keywords: Vinpocetine; clinical uses; expert opinion

Introduction

Vinpocetine (Ethyl-apovincaminate) is a derivative of vincamine which is an alkaloid compound. Vinpocetine intravenous infusion was reported to increase cerebral blood flow measured by the two-minute radioactive Xenon technique in healthy volunteers [3].

During the 1970s and early 1980s the use of vinpocetine in the treatment hearing defects, Ménière disease, motion sickness, vascular retinal lesions, circulatory insufficiency of the lower limbs, and cerebrovascular disorders was suggested [1-8]. In 1985, Subhan and Hindmarch reported a placebo-controlled study which included 12 healthy female volunteers. The study showed that vinpocetine 40 mg three times daily can considerably improve memory [9]. In 1986, Domzał and colleagues reported a study which included patients with acute ischemic stroke. 14 patients were treated with intravenous vinpocetine, and 12 patients received aminophylline twice daily for 10 days. Of the 14 patients treated with vinpocetine, two patients died and 12 experienced improvement. In the 10 patients treated with aminophylline, 5 patients died, and two patients didn't improve. There was no correlation between clinical improvement and CT-scan improvement However, vinpocetine treatment was associated a considerable improvement on CT-scan changes [10]. In 1987, Balestreri and colleagues reported a placebo-controlled study which included elderly patients with chronic cerebral dysfunction. 42 patients were treated with vinpocetine 30 mg in 3 divided doses daily for one month, followed by 15 mg in 3 divided doses daily for 2 months. 42 patients received placebo for the 3 months. Vinpocetine treatment was associated with considerable improvement in mental function and without the occurrence of serious side effects [11]. In 1990, Kiss from Hungary reported a study which included 40 postmenopausal female patients which showed that vinpocetine can have adjuvant role in the treatment of climacteric symptoms [12]. In 1991, Dutov et al reported a study which suggested that when vinpocetine is given to children who had experienced birth trauma, it can beneficial effects with reduction of the possible convulsive tendency, and may contribute to a better psychomotor development [13]. Also in 1991, Hindmarch and colleagues from England reported a placebo-controlled study which included 203 patients who had mild to moderate organic psycho-syndromes such as primary dementia. Patients received either vinpocetine 30 mg daily in 3 divided doses, vinpocetine 60 mg daily in 3 divided doses for 16 weeks, or received placebo. Vinpocetine was not associated with relevant side-effects when compared with placebo. Both doses of vinpocetine were associated with considerable improvements in cognitive performance, depressive symptoms, and quality of life [14]. In 1992, Burtsev et al reported their 10-year experience with the use of vinpocetine in the treatment of 967 patients with a variety of cerebrovascular disorder. They found that vinpocetine is more likely to have beneficial effects when used in patients with early forms and primary forms of chronic neuro-circulatory disorders associated with evidence of brain blood supply insufficiency, and in circulatory encephalopathy. Vinpocetine was associated with symptomatic improvement when used in the treatment of ischemic stroke. Burtsev et al suggested that vinpocetine should not be used in severe cerebral hypertensive crises, acute cardio-cerebral or cerebro-cardiac

syndrome, and, disorders associated with marked abnormality of heart rhythm [15].

In 2001, Feigin et al from Germany reported a study which included 30 patients with acute ischemic stroke diagnosed by brain CT-scan. Within 72 hours of the onset of stroke, 15 patients received low-molecular weight dextran plus vinpocetine, and 15 patients received low-molecular weight dextran only. Vinpocetine treatment was associated with a better outcome. Vinpocetine was not associated with important adverse effects [16]. In 2002, Bönöczk and colleagues from Hungary reported a placebo-controlled study which included forty-three patients who had ischemic stroke who received either a single-dose intravenous infusion of vinpocetine (20 mg in 500 ml saline) or placebo (500 ml saline).

Vinpocetine was associated with an increase in cerebral perfusion and parenchymal oxygen extraction as measured by trans-cranial Doppler and near infrared spectroscopy [17]. In 2007, Valikovics reported a study which included patients who had ischemic cerebrovascular stroke associated with mild cognitive defect who were treated with oral vinpocetine for two weeks. Treatment was associated with a marked improvement in cognitive functions that was attributed to an increase in blood flow velocity which was measured by trans-cranial Doppler [18]. In 2009, Chukanova reported a controlled study which included patients with chronic cerebrovascular insufficiency. 138 patients were treated with oral vinpocetine 30 mg daily plus the conventional hypotensive and antithrombotic medications for three months. 98 control patients received the conventional medications only. The addition of vinpocetine resulted in more improvement in the neurological symptoms than the improvement in the control patients. Patients who received vinpocetine also experienced marked reduction in the risk of progression of the cerebrovascular insufficiency, and in the development of transient ischemic attacks, and ischemic strokes, when compared to the control patients [19]. Also in 2009, Afon'kin et al reported a study which included fifty patients with chronic neurosensory hearing impairment treated with vinpocetine. Treatment was associated with marked improvement of audiologic parameters in 80% of the patients with reduction of tympanophonia [20]. In 2016, Zhang et al from China reported a study which included 610 patients with acute cerebral infarction. 469 patients were treated with citicoline (cytidine disphosphate choline) 400-500 mg plus aspirin 75-100 mg or clopidogrel 75 mg one time daily plus vinpocetine 30 mg intravenously one time daily for one week. 141 patients were treated with citicoline 400-500 mg plus aspirin 75-100 mg or clopidogrel 75 mg one time daily for one week. The patients' hypertension, hyperglycemia, hyperlipidemia, and intracranial hypertension were treated as appropriate. Three months after treatment, patients who received vinpocetine experienced marked improvement in cognitive and neurological functions, and quality of life. The beneficial effects of vinpocetine were attributed increasing cerebral blood flow [21]. In 2019, Garza-Morales et al from Mexico reported a placebo-controlled study which included 87 patients who had focal epilepsy treated with one to three antiepileptic medications. Forty-one patients received vinpocetine (2 mg per kg daily) as an adjuvant therapy and forty-six patients received placebo.69% of the patients who received vinpocetine experienced a 50% reduction in seizures, while only 13% of the patients who received placebo experienced reduction in seizures. There were no important differences in the occurrence of adverse effects in patients who received vinpocetine and the patients who received placebo. The most frequent adverse effect seen with vinpocetine was headache which occurred in 7.9% and diplopia which occurred in 5.2%. Therefore, vinpocetine was found to be well tolerated and more effective than placebo in decreasing seizure frequency ($p < 0.0001$) [22]. Gutiérrez-Farfán et al from Mexico reported a one-year study which included adults who had acquired sensorineural hearing impairment who were treated with vinpocetine (30 mg daily in 3 divided doses. Treatment had a beneficial effect by stopping the deterioration and leading to some improvement [23]. In 2022, Panda et al from India reported the findings of a systematic review and meta-Analysis which included 4 placebo-controlled studies involving 601 treated with vinpocetine, and 236 patients received placebo. The patients who received vinpocetine experienced less deaths and less severe disability than the patients who received placebo, at both one month and three months. The findings of Panda et al et al suggested that vinpocetine has the potential to be beneficial in the treatment of ischemic cerebral stroke, and may help in reducing the associated disability [24].

Expert opinion

The current evidence-based expert opinion suggests that vinpocetine as a monotherapy is unlikely to be beneficial in any disorder. However, there is some evidence suggesting that the use of vinpocetine as adjunctive therapy in patients with chronic cerebrovascular ischemia can have a beneficial effect on cognitive functions and the quality of life.

Conflict of interest: None.

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