

Predicting the Window Period of Stroke by Ocular Risk Factors

Sanjoy Chowdhury*

Department of Ophthalmology, Toho University Sakura Medical Center, Chiba, India

ABSTRACT

Aim:

To predict the window period of stroke (CVA) by analyzing ocular risk factors.

Method:

A retrospective study was performed in all consenting patients with diagnosis of stroke made by the department of neurology.

Conclusion:

Ocular risk factors can predict imminent stroke. HTN retinopathy and Diabetic retinopathy are the long term risk factors whereas BRAO and CRAO, CRVO are short term risk factors. Hence early prediction can help in early management thus reducing the occurrence of stroke.

Keywords: Diabetic Retinopathy; Bacterial identification; HTN retinopathy; Hypertensive retinopathy

INTRODUCTION

Stroke is a major health problem characterized by sudden onset of focal and neurological signs and symptoms caused by cerebrovascular origin by rapidly developing focal or global disturbances of cerebral function lasting >24hr [1].

There is increasing evidence that small-vessel disease is a systemic vascular disorder that can be a major cause of stroke [2]. Retinal vasculature is a circulatory system in the eye that can be observed without invasive procedures and provides useful information about the microcirculation system in the body [3]. The retinal blood vessels, measuring 100 to 300um in size, offer a unique and easily accessible window to study correlates and consequences of cerebral micro vascular disease, because the retina and brain share similar anatomical and physiological properties. The retinal blood vessels are of the size and physiology similar to that of the cerebral small vessels [4]. Retinal image computing methods are being developed to access retinal micro vascular characteristics and the presence and severity of any changes in the vascular system. The quantified retinal micro vascular abnormalities (HTN retinopathy, Diabetic Retinopathy, CRAO, CRVO, BRVO) might be useful as risk indicators for cerebrovascular disease [5]. Some studies have shown that certain retinal micro vascular abnormalities are associated with stroke

and might act as surrogate markers for cerebral small-vessel diseases [6]. In the last decade there have been several studies which have consistently shown that retinal micro vascular signs are predictors of clinical stroke events, [7] stroke death [8] and are associated with sub-clinical measures of cerebral disease [9]. In this study we aimed to predict the window period of stroke by above ocular risk factors [10].

METHODOLOGY

A Retrospective study was performed in all consenting patients with diagnosis of stroke made by the consultant of neurology unit of multispecialty hospital.

Inclusion criteria:

1. Conscious stable patients with diagnosis of stroke.
2. Patients with history of hypertension and/or diabetes.
3. Patients with recorded history of ocular comorbidities like Hypertensive retinopathy, Diabetic retinopathy, CRAO CRVO, BRAO and BRVO.

A total of 24 cases were included after taking informed consent. Mean age of patients were 60yrs. Patients data on age, sex, and history taken regarding past significant medical and ocular

Correspondence to: Sanjoy Chowdhury, Department of Ophthalmology, Toho University Sakura Medical Center, Chiba, India; E-mail: drsanjoy@hotmail.com

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pathology and detailed ocular examination was done. Retinal vascular changes like HTN Retinopathy, Diabetic Retinopathy, CRAO, and CRVO were recorded with duration of occurrence from old records. Also the time of occurrence of the stroke with other systemic findings were recorded. Window period of stroke is calculated by time of occurrence of first retinal vascular change to the time when diagnosis of stroke first made. Depending upon the calculated window period of stroke, the ocular risk factors into long term and short term risk factors.

AFTER TAKING COMPLETE HISTORY PATIENTS WERE EXAMINED

Retinal vascular assessment:

Digital fundus photography was taken using a fundus camera (canon CR-Dgi with a 10D SLR digital camera) after pupil dilation using tropic amide. Retinal images were taken and confirmed the findings with the previous records of the patients.

RESULTS

In 24 cases with mean age of 60 yr. were included. Male: Female ratio 3:1, Of these pre-stroke ocular findings from records shows 16.6% patients had HTN Retinopathy changes for mean period of 18 months and 16.5% had DR for period of 14 months, Retinal vasculopathy seen in 25% included CRAO, CRVO for period of 1-3 months and BRVO for 3-6 months.

DISCUSSION

In this study we predict the window period of stroke by ocular risk factors and classified them into long term and short term risk factors causing future risk of stroke.

In our study we observed that CRAO, CRVO, BRVO were the risk factors and also the short term risk factors, as they cause future stroke within 1-3 months in CRAO, CRVO patients and within 3-6 months in BRVO patients. We found that these patients with ocular risk factors exhibited a higher risk of future stroke. In our study patients who had hypertensive retinopathy exhibited stroke after the window period of >1yr. So classified as low risk and long term predicting factor of stroke. In our study patients had diabetic retinopathy exhibited the stroke after the window period >1yr. So classified as low risk and also long term predicting factor of stroke.

CONCLUSION

Ocular risk factors can predict imminent of stroke. HTN Retinopathy and DR causing stroke after the period of >1yr of their occurrence whereas BRAO causing stroke within <6months of its occurrence and CRAO, CRVO causing stroke within < 3months of its occurrence. So it states that HTN Retinopathy and DR are the long term risk factors whereas CRAO, CRVO, BRVO are short term risk factors. Hence early prediction of these ocular risk factors helps in early management and thus reducing the occurrence of stroke.

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