INTERNATIONAL
AYURVEDIC MEDICAL
JOURNAL

IAMJ

International Ayurvedic Medical Journal, (*ISSN: 2320 5091)* (April, 2017) 5 (4)

APPROACH TO DIAGNOSIS OF AYURVEDIC EYE DISORDERS BY MEANS OF MODERN DIAGNOSTIC TOOLS

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ABSTRACT

Acharyas have described numerous ways of diagnosing *netragata vyadhis*(eye diseases) in various *Samhitas*. In the present era due to the change in life style, various *netragata roga* are increasing and to treat them at early stage and in short period is the challenge. To overcome this, latest technologies developed by scientists are very helpful and hence serving to the mankind at its best. In this sense, we can enumerate here many instruments and techniques that are commonly used in eye clinics, like vision chartings, slit lamp, ophthalmoscope, retinoscope, autorefractometer, OCT, perimetry, and so on. After all best treatment is the ultimate result of good diagnosis.

Keywords – Shalakya, ocular diseases, instruments, technology.

INTRODUCTION

Shalakya tantra is among one of the eight branches *(astangas)* of *Ayurveda* that deals with many disorders manifested at *urdhwajatru* i.e. above supraclavicular region[1]. *Acharyas* at that time have described examination of eye by means of *Trividha Parikshana – Darshana Parikshana, Sparshana Parikshana, Prashna Parikshana, Ashtavidha Parikshana, Strava Parikshana,* etc. to diagnose the eye disorders. But, in the present era we cannot find it easy to understand and thorough examination is required to diagnose the disease. In this context if we have knowledge of present science that is providing us very fine details of eye, it becomes easy to apply *ayurvedic* treatment described in various *samhitas*.

Material and Methodology-

Study of literature – Study of literature was done with the help of books, *Samhitas* and internet websites.

Study of modern diagnostic tools –

Visual Acuity- Assessment of Vision is the first step in eye examination. Acuity is a measure of the capacity of the visual system to resolve detail. It is recorded as a fraction according to Snellen notation, using a standard test type chart at a set distance from the patient under constant illumination 6/6 or 1.0 indicates that the smallest detail which can be resolved by the tested eye is the same as can be resolved by a healthy emmetropic eye at 6 m.[2] It is also a measure of the smallest retinal image which can be appreciated regarding its shape and size.

Slit lamp – A slit lamp is a high powered binocular compound microscope with a slit shaped illumination source that enables a detailed examination of anterior segment of the eye. This instrument can be regarded today as an ophthalmologists best friend as it can provide not only information on the anterior ocular structures, but also be used to aid in various other functions like measurement of Intraocular pressure , posterior pole evaluation , gonioscopy, specular microscopy and corneal pachymetry with the help of added optical attachments. This instrument gives the benefit of binocular vision and stereoscopic examination.[3]

Objective Refraction- The objective methods of refraction include retinoscopy, refractometry and keratometry.[4]

Refractometry utilizes the principles of indirect ophthalmoscopy. The conventional refractometers include dioptron, ophthalmometron. Presently, the computerized autorefractometers are being used increasingly. The computerized, autorefractometer quickly gives information about the refractive error of the patient in terms of sphere, cylinder with axis and interpupillary distance.[5]

Ophthalmoscopy – It remains an important tool for complete evaluation of posterior segment of eye. It is of two types direct and indirect. Direct ophthalmoscope is most commonly used in practice.[6]

Instrumental Tonometry – Intra ocular tension is measured by two types of tonometer.

a) Contact tonometer-i) Indentation tonometer which include –Schiotz tonometer (manual type) ii) Mackay Marg (electronic type)
b) Applanation tonometer (AT)

   i) Goldmann AT (slit lamp mounted)

   ii) Parkins AT (hand held) [7]

Corneal topography –Corneal imaging techniques are rapidly evolving into higher standards and understanding their significance is imperative in management of common corneal refractive clinical situations. Corneal topography instruments used in clinical practice most often are based on Placido refractive image analysis.

Cornea is the most important the optic component of human eye, providing 2/3 of refractive power of eye. Corneal topography is non invasive imaging technique for mapping the surface curvature of cornea. It is mainly used to detect corneal pathologies like keratoconus, keratoglobus, marginal degeneration, ectactic disorders etc.[8]

Flourescien angiography –Flourescien angiography has now become a useful diagnostic

tool that has aided diagnosis and monitoring of treatment of retinal, vascular and macular disorders. The study and diagnosis of retinal, macular and choroidal pathologic lesions is done using Flourescien angiography. With the development of high quality retinal fundus camera, digital imaging and photographic filters high resolution angiography of retina and choroid is possible.[9]

Gonioscopy – Gonioscopy is a clinical biomicroscopic technique that allows the structure in the anterior chamber angle to be visualized.[10]

Perimetry – It is the procedure for estimating extent of the visual fields.

Scotoma refers to an area of loss of vision totally (absolute scotoma) or partially (relative scotoma) in the visual fields.[11]

Computerized perimeters (Humphrey, Octopus, Dicon, Henson) are sensitive, flexible, easy to operate, and give an automated display and printout, but are relatively costly. Screening tests present suprathreshold stimuli at different points across the field, recording missed presentations as scotomas. Threshold tests vary the brightness of presented stimuli at each point, to determine the threshold of perception at different points on the field. Both suprathreshold and threshold tests take automatic account of the lower sensitivity of the peripheral than the central field, Computerized perimeters incorporate tests of subject reliability, by checking the blindspot and re-checking previously tested points, and can also results for future comparison and statistical analysis.

Friedmann visual field analysis is static perimeter. The intensity is adjusted according to the age of the subject, to correspond approximately with predicted normal threshold intensity. The test is quick to carry out and the device is easy to operate. The programme of stimuli is fixed and restricted, and the fields it produces are intended for glaucoma screening.

Goldmann perimeter can be used as a static (like Friedmann) or kinetic perimeter. It requires some skill and practice to use effectively, but because of its sensitivity and flexibility, it can be used accurately to plot field defects of any type.[12]

Ultrasonography – It is non invasive efficient, in expensive diagnostic tool to detect and differentiate various ocular and orbital pathologies. It is an indispensable tool for calculation of intraocular lens power, evaluation of posterior segment behind dense cataract or vitreous hemorrhage, diagnosis of complex vitreoretinal condition and differentiation of retinal mass. A-scan is indicated for evaluation of posterior segments. It is also used to evaluate and localize and differentiate tumors and assess its growth during follow up, as well as to detect intraocular damage in case of trauma. Biometry is another important indication of A-scan for accurate axial length of globe, evaluating congenital glaucoma, micropthalmos, myopia, pthiss bulbi.[13]

B scan (brightness mode) displays the sonic reflectivity of a two-dimensional (plane) beam on a two-dimensional grey scale. It shows the posterior corneal surface, lens, and retina, as well as any abnormal interface which may be present (vitreous haemorrhage, retinal detachment, tumour surface and calcification).

A-mode scan is performed directly on the anaesthetized cornea, as in applanation. B-mode scan is performed through closed lids using coupling gel.[14]

Ultrasound biometry has its advantages in visualizing structures behind iris, for ruling out angle closure glaucoma, anterior segment tumour, to rule out plateau iris.

OCT – Optical coherence tomography (OCT) is an optical technique of high resolution, cross sectional imaging of tissue. OCT imaging employs software that allows customized cross sectional optical cut sections to suit to a particular subject for the disease under study. [15] It is used to measure retinal thickness, retinal nerve fibre layer, volume of retina, create retinal maps, various parameters of optic disc, displays three d images.

Ocular surface staining – Fluorescein and rose Bengal stain ocular surface abnormalities and epithelial defects. Fluorescein stains the tear film, and bare stroma devoid of overlying epithelial cover. Rose Bengal stains desiccated or devitalized epithelial cells, and mucus fragments in the tear film.[16]

Observation/ Result –

Acharya described *Trividha Parikshana* which is important while diagnosing the ocular diseases. History taking comes under *Prashna Parikshana*. Assessment of visual acuity is the first step in eye examination. Here it can be said that *Acharyas* have used the term *Drishti* for visual acuity.

In *Drushtigata rogas Acharya Sushruta* has described various *Patalagata dosh dushti lakshana* which are seen now in Perimetry in the form of central scotoma, peripheral scotoma. The *lakshanas* mentioned in *Tritiya Patala* and *Chaturtha Patala* is due to field defect. Due to the lack of technology at that time they have just mentioned the *Lakshana*. With the help of Perimetry we can diagnose the eye disorder at early stage.

It can be said that in indentation tonometry, manually IOP is recorded which comes under *Sparshan Parikshana* described by the *Acharya*. 'A scan' in applanation for calculation of intraocular lens power, 'B scan' for evaluation of posterior segment behind dense cataract or vitreous hemorrhage comes under *Sparshana Parikshana*.

All the scientific tools Slit lamp, Refractometry, Ophthalmoscopy, Tonometry, Corneal topography, Perimetry, Gonioscopy, Flourescien angiography, OCT, etc. comes under the *Darshana Parishana*.

The ancient scientists had so vast knowledge that they described all the diseases and their treatment which are applicable even today. Although the basic problem lies in the fact that they just enumerated all the things in the way they found at that time accordingly, but now in the present era we cannot find it easy to diagnose.

DISCUSSION AND CONCLUSION

In the last decade evolution of various innovative high tech procedures are seen in the field of ophthalmology**.**

Nobody can really predict what will be our perspective for visually impaired people in the next 20 years. But indeed the progress in this area, coming from serious research in diagnos-

tic tools is bringing hope to those who have nothing.

By using these scientific tools, ocular diseases can be diagnosed thoroughly followed by prescribing appropriate *ayurvedic* treatment.

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Source of Support: Nil
Conflict Of Interest: None Declared

How to cite this URL: Khole Shraddha Shirish & Virkar Chandana Abhay: Approach To Diagnosis Of Ayurvedic Eye Disorders By Means Of Modern Diagnostic Tools. International Ayurvedic Medical Journal {online} 2017 {cited April, 2017} Available from: http://www.iamj.in/posts/images/upload/1173_1177.pdf