Assessment of Vision of Deaf-Blind Persons: A Review

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1. Introduction

The deaf-blind population is a small group of people with special needs in visual assessment. Although small in number, this group shows great variation in its clinical picture. The age of onset of the two impairments causes one important variable. Since the deaf-blind person may be born deaf, hard of hearing or with normal hearing; blind, partially sighted or normally sighted, there are nine different groups of deaf-blind individuals with respect to very early development. A later loss of sensory functions may occur at any age. The effect of the impairments on the development of different functions is different if the function is lost during the first year of life, during pre-school age before or after the development of spoken language, at school age, or in senescence.

The deaf-blind population can be divided into three distinct groups: (1) patients with good language skills, spoken language, American Sign Language (ASL) or any other sign language; (2) patients with limited language skills; and (3) patients with no language. This review covers assessment of the vision of deaf-blind patients with good or limited language skills.

If the deaf-blind patient uses auditory communication or purely tactile communication, tactile signing, the assessment is very similar to the assessment of a hearing patient. Problems arise whenever visual sign language is used, because we use the same modality, vision, for communication when assessing its function. The limited vision causes technical problems in communication and at the same time there are the usual problems related to interpretation from a spoken language to a sign language. Both the technical and the communication problems cause changes in the pattern of information exchange and require some training before communication is fluent in the patient-interpreter-examiner triad.
2. Adaptation Problems

Luminance level and reflection from glossy surfaces is a common problem. Narrow range of visual adaptation is especially frequent among patients with Usher syndrome. The patient should be at the luminance level used during the examination at least half an hour before the assessment starts. Otherwise the vision of the patient is gradually adapting to the luminance level, which causes variation in the test results. This is often experienced in laboratories when visual field is measured. If the patient comes to the laboratory on a bright day and the measurement is started immediately, the slow increase in the size of the isopters can be documented. If the technician is unaware of the phenomenon he might interpret it as a sign of poor co-operation. An automatic perimeter will, of course, be unable to handle this situation. Hysteric constriction of the visual field during the examination is well known. The gradually increasing visual field of retinitis pigmentosa patients should become as well known.

At the beginning of the examination the first questions should be: is the light level comfortable? (It would be best to allow the patient to adjust the lighting to be comfortable by using an attenuator or a dimmer switch.) Can you see the interpreter well enough? Is the background good or does it bother you? (A dark screen behind the interpreter improves visibility of the signs in many cases.) Do any of the shiny instruments cause dazzle? It is advisable never to use a white coat or clothing with contrasting stripes or checks during the visual assessment, because they may effectively disturb the vision of many visually impaired people [sequence 1,2]*.

3. Communication Field

The distance at which the interpreter should sit and the size of the communication field at that distance should be assessed before any other measurements are done.

The space usually used for signing is approximately 50-60 cm in diameter. One degree of angle of vision is equal to one centimeter at a distance of half a meter (57 cm) or two feet.