Research Article

Study of transient hearing loss after subarachnoid block

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Abstract

Introduction: The most common complications observed **after subarachnoid block** are post-dural headache, hypotension and bradycardia. Direct nerve damage, hypothermia, damage to the spinal cord and spinal infection are some rare complication. Mild and transient hearing deficiency is not very uncommon after anaesthesia which improves before patient is fully aware of the problem. **Aims and objectives:** To Study of the transient hearing loss as a complication of subarachnoid block **Material and Method:** In the present study 50 subjects were selected who were posted for various surgeries under subarachnoid block. Normal hearing power has been the first precondition for patient selection in study. Preanesthetic examination was conducted in all the study patients. Audiometry was performed in all the patients before surgery. To record the hearing loss audiogram was taken on second and fifth day following surgery in the audiometry room. **Results:** Majority of the subjects (48%) were in the age group of 21 to 30 years followed by 41-50 years group (22%). 58% subjects were male. The incidence of transient hearing loss was observed in 8% subjects. Post spinal hypotension was observed in 20% subjects whereas Post spinal headache was reported by 14% subject. Out of 4 subjects of transient hearing loss three were male. Three subjects were more than 40 years of age. The audoimetry performed after one month showed that and hearing was normal in all the subjects. **Conclusion:** Thus we conclude that incidence of hearing loss was 8% and it was found that hearing loss was completely reversible.
Keywords: hearing loss, subarachnoid block.

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INTRODUCTION

Pain is one of man's most distressing experiences. Relief of pain during surgery is the aim of anesthesia. Although pain demands relief on humanitarian ground also, in many cases treatment reduces physical morbidity after operation. Anesthesiology has been a fascinating branch of medicine and due to multifold advantages; Spinal anesthesia has occupied a unique place in anesthesiology. Since introduction of spinal anesthesia by August Bier[1] in 1898, there has been many reports regarding its effects and complications. Various complication s has been reported by various authors and studies. The most common complications observed are post-dural headache, hypotension and bradycardia. Direct nerve damage, hypothermia, damage to the spinal cord and spinal infection are some rare complication. Mild and transient hearing deficiency is not very uncommon after anaesthesia which improves before patient is fully aware of the problem.[2] Sudden sensorineural hearing loss (SSNHL) after subarachnoid block is a very rare complication and little difficult to explain. The Cerebro-spinal Fluid (CSF) dynamics are important for auditory function of the inner ear. The first reported case of hearing impairment after spinal anaesthesia was reported in 1914.[3] Since then, it has been well documented that reversible SNHL can occur after spinal anaesthesia and following procedures involving lumbar puncture.[4,5,6] The hearing loss is either unilateral or bilateral, low frequency and usually reverses spontaneously although there are a few documented cases where the SNHL has not reversed.[7] Vandam and Dripps[8] after exhaustive follow up survey of 10098 patients who received spinal anaesthesia for a long term basis, state that a syndrome of

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decreased intracranial pressure was noted, symptomology of which included headache, ocular and auditory difficulties. In the present study along with the common complications we studied the incidence of transient hearing loss and its age and sexwise relation in patients undergoing various surgeries after subarachnoid block.

AIMS AND OBJECTIVES

To Study of the transient hearing loss as a complication of subarachnoid block

MATERIAL AND METHOD

The present study was conducted on patients admitted for various surgeries in the institute. Patients were selected from the age group of 20 to 60. Normal hearing power has been the first precondition for patient selection in study. Patients not willing for Spinal anesthesia or nervous or very apprehensive patients were excluded from the study. The procedure of spinal anesthesia for them has been carefully explained to them in order to clear any of their doubt and to obtain their full cooperation. All the patients were in grade I and II classification of the American Society of Anaesthesiologists. Thus total 50 patients were selected for the study. Informed consent of each and every patient is taken before the procedure. Preanesthetic examination was conducted in all the study patients. Detailed physical examination was carried out which included aim to detect any nutritional or metabolic disorder. Spine was examined to see presence of any skin infection, deformity, calcification, movements and history of previous operation. Audiometry was performed in all the patients before surgery. To record the hearing loss audiogram was taken on second and fifth day following surgery in the audiometry room. Audiometry was done in a sound-proof room using Arphi portable audiometer. The technique used was by descending method and patient signals the disappearance of hearing after hearing multiple sound signals of higher decibel strength for same frequency of sound wave. Then graph is plotted and kept for record for revaluation for audiometric findings subsequently in the post-operative period. In patients with hearing loss a follow up audiogram was taken after one month to verify if return to normally of hearing power had occurred. The complications that have occurred had also been recorded. All the findings were recorded on a prestructured proforma.

RESULTS

Table 1: Age and sexwise distribution of study subjects

Variable		No. of patients	Percentage
Age group	21 – 30	21	48
	31 – 40	8	16
	41 – 50	11	22
	51 – 60	10	20
Sex	Male	29	58
	Female	21	42

It was observed that majority of the subjects (48%) were in the age group of 21 to 30 years followed by 41-50 years group (22%). Sexwise distribution of patients showed that 58% subjects were male.

Table 2: Distribution of subjects according various complications occurred due to spinal anesthesia

Complication	No.	%
Transient hearing loss	4	8
Post spinal headache	7	14
Post spinal hypotension	10	20

The incidence of transient hearing loss was observed in 8% subjects. Post spinal hypotension was observed in 20% subjects whereas Post spinal headache was reported by 14% subject.

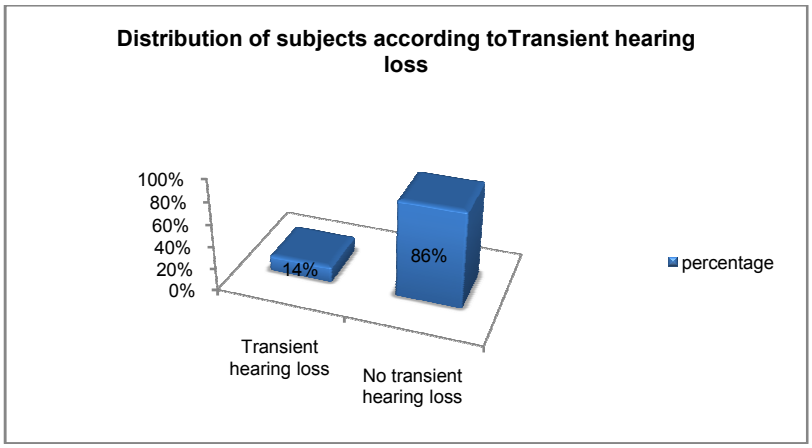

Figure 1:

Table 3: Age and sex wise distribution of patients with Transient hearing loss

Age Group	Sex		Total
	Male	Female	
20 - 30	0	0	0
31 - 40	0	1	1
41 - 50	2	0	2
51 - 60	1	0	1
Total	**3**	**1**	**4**

It was observed that out of 4 subjects of transient hearing loss three were male. Three subjects were more than 40 years of age.

DISCUSSION

In the present study majority of the subjects (48%) were in the age group of 21 to 30 years followed by 41-50 years group (22%). 58% subjects were male. Various complications were observed in the study. Post spinal hypotension was observed in 20% subjects whereas Post spinal headache was reported by 14% subject. According to B. S. Rasmussen *et al*[9] headache was the common complaint of spinal anesthesia and was posture dependant. It was related to the subdural hypotension attributable to continued leakage of cerebrospinal fluid. Occurrence of headache is unpredictable reported incidence l.2 to 46 %. Three factors seemed to influence namely - size of spinal needle, age and sex of patient. The incidence of post spinal headache can be diminished by use of fine needle. It decreases with age and more common in women. In the present study incidence of post spinal headache was 14% and it was decreasing with age. Only 4% cases were of 50-60 age groups and remaining were 10% belonging to young age group and incidence of post spinal headache in both sexes is almost equal. As far etiology of post spinal headache is concerned according to Mark Mehta *et al*[10] low pressure headache is generally believed to be due to traction on intracranial structures consequent on low cerebrospinal pressure due to continued seepage through the dural puncture. R. S. Atkinson.*et al*[11] and Selwyn Crawford *et al*[12] also observed similar findings in their study. Basically incidences of spinal anesthesia complications other than post spinal headache are rare. Fredrick K. Orkin *et al*[13] held the view that a syndrome of decreased intracranial pressure exists and it includes headache, ocular and auditory complications. Vandam and Dripps[8] studied 9277 cases of spinal anesthesia in which headache occurred in 1011cases, Ocular difficulties in 34 and auditory difficulties in 35 cases. Auditory complaints included decreased hearing, obstruction, plugging, popping, and tinnitus. Overall incidence in women was twice than men. Tinnitus and deafness may occur and are explained on the basis of low cerebrospinal pressure resulting in low intra labyrinthine pressure and consequent hearing loss. L.P. Wang *et al*[14] after studying the effects of spinal anesthesia on hearing have reported that transient hearing loss for low frequency was totally reversible. Incidence of transient hearing loss was 42% in their study. In the contrary our study had reported the incidence of 8% only; which was not comparable with the above study. But the hearing loss in all the patients was transient and all the patients had regained their normal hearing in one month. Significant fall of blood pressure of 30mm of Hg or more was noted in 10 patients during intraoperative period (mean of preoperative 126.7 and postoperative 96.8mm Hg) and was treated with intravenous fluids only. It was observed that the degree of hypotension was greater at higher levels of spinal anesthesia. The fall in blood pressure depends upon the blockage, therefore if substantial number of thoracic segments are blocked more, then it becomes more evident. Sympathetic blockade extends somewhat higher than sensory block because B fibres are more sensitive than A and C fibres to local anaesthetics. Therefore, hypotension is related to the height of spinal block (H.C. Churchill Davidson)[15] According to Marx G.F. and Orkin L.R.[16] in connection with transurethral surgery, transient hypotension may be associated with ischemic changes and ischemic etiology of transient hearing loss may be a possible cause of post-operative hearing loss. According to Arnvlg *et al*[17] transient decrease in hearing after lumbar puncture is associated with decrease in the cerebrospinal fluid pressure which may be transmitted via cochlear aqueduct and resulting in corresponding decrease in perilymphatic pressure, this mechanism resulting in auditory disturbances. According to Hughson W *et al*[18] decreased cerebrospinal fluid pressure predisposes to the reduced intralabyrinthine pressure with resultant transient hearing loss. Therefore adoption of fine gauge needle for giving spinal anesthesia will result in less loss of cerebrospinal fluid through the punctured dura hole and less chances of low intralabyrinthine pressure resulting in hearing loss. As evident from this prolonged discussion that incidence of temporary hearing loss is really a rare one, 8% in our study. Temporary hearing loss remains for about one month duration. As only 4 cases there were of hearing loss, unless more exhaustive surgery encountering much more number of the patients prediction regarding age and sex incidence shall not be reaching a correct destination. The cases having temporary hearing loss do also have hypotension and post spinal headache, they definitely have interlink with development of hearing loss. More exhaustive study also is required for this reason.

CONCLUSION

Thus we conclude that incidence of hearing loss was 8% and it was found that hearing loss was completely reversible.

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