

## CHAPTER I

### INTRODUCTION

#### 1.1 Background

Although a precise definition is debated, hydrocephalus is generally described as a disorder of cerebrospinal fluid (CSF) physiology that results in abnormal enlargement of the cerebral ventricles (Kahle et al., 2016). This disorder is closely related to demographic disparities, with incidence rates of 145 and 316 per 100,000 births reported in Africa and Latin America, respectively, while incidence rates of 68 per 100,000 births in the United States and Canada region (Dewan et al., 2019).

Hydrocephalus left untreated can lead to macrocephaly, cognitive dysfunction, and even death. After ten years, patients with untreated hydrocephalus had a 46 percent survival rate (Jorgensen et al., 2016; Dewan et al., 2019). People with untreated hydrocephalus may have a lower quality of life due to cognitive impairment, which affects 62 percent of the population. Cognitive disorders include psychomotor slowing and impairment of attention, working memory, verbal fluency, and executive function (Jorgensen et al., 2016).

The treatment for hydrocephalus depends on what the causes are. In patients with type 2 Chiari malformation, shunting is required to correct myelomeningocele. Although in utero myelomeningocele repair is ideal for preventing brain herniation, the procedure is not yet the standard of care. In cases of aqueduct stenosis, the endoscopic third ventriculostomy procedure is used when the fourth ventricular enlargement is absent and has also been used for cases such as shunt failure, post hemorrhagic hydrocephalus, and Chiari malformations in the field of pediatric neurosurgery (Filis et al., 2017).

Shunting, particularly the ventriculoperitoneal shunt, remains the preferred choice for CSF diversion because the ventricular catheter can be placed more reliably from the

coronal approach and also the low probability of long-term complications and other risks. Ventriculoatrial shunt (VA Shunt) was initially the first choice, but as complications were discovered, the VA shunt was shifted to an alternative for patients who had contraindications to abdominal catheter placement (Hung et al., 2017).

Although Ventriculoatrial Shunt may not be the gold standard of hydrocephalus treatment, it can be used as an alternative for patients who are not candidates for other treatments such as Ventriculoperitoneal Shunt. As a result, a diagnosis and a thorough understanding are needed to validate the use of this method in a patient by thoroughly examining the patient's treatment history, clinical findings, and laboratory examination. As a result, the focus of this study will be on the patient's treatment history, clinical findings, and laboratory examination results in order to gather data and establish a solid foundation for validating the use of a Ventriculoatrial shunt in a patient.

The research will be conducted at RSUD Dr. Soetomo, Surabaya, Indonesia as one of the leading hospitals in Indonesia with the majority of the patients varying from East Indonesia.

## **1.2 Research Problem**

What is the clinical and laboratory profile of pediatric hydrocephalus patient with Ventriculoatrial Shunt?

## **1.3 Objective**

### **1.3.1 General Objective**

To understand and evaluate laboratory and clinical profile that can be used as a marker in patients with hydrocephalus and used to justify the insertion of a Ventriculoatrial shunt in RSUD Dr. Soetomo

### **1.3.2 Specific Objective**

1. This research is expected to provide information regarding the demographic profiles of pediatric hydrocephalus patient with Ventriculoatrial shunt.
2. This research is expected to provide information regarding the history of treatment and surgery profiles of pediatric hydrocephalus patient with Ventriculoatrial shunt.
3. This research is expected to provide information regarding the clinical complaint in pediatric hydrocephalus patient with Ventriculoatrial shunt.
4. This research is expected to provide information regarding the cerebrospinal fluid analysis profiles in pediatric hydrocephalus patient with Ventriculoatrial shunt.

## **1.4 Benefit**

### **1.4.1 Academic Benefit**

To provide a better understanding of the laboratory and clinical profile that may occur in pediatric hydrocephalus patients with Ventriculoatrial Shunt

### **1.4.2 Practical Benefit**

1. To understand the condition of pediatric hydrocephalus patient with Ventriculoatrial Shunt
2. To provide secondary data and serves as a reference in future research of Ventriculoatrial shunt both nationally and internationally
3. To bridge the gap of knowledge and study between Ventriculoatrial Shunt and other hydrocephalus treatment