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# HEMOLYTIC UREMIC SYNDROME IN CHILDREN

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# INTRODUCTION



- **Hemolytic Uremic Syndrome (HUS) is the most common cause of sudden, short term acute renal failure in children.**
- **Hemodialysis (HD) and peritoneal dialysis (PD) are treatment options for these patients.**

# CLASSIFICATION of HUS



- **HUS is one of the thrombotic microangiopathies which are classified as:**
  - **HUS**
    - **Shiga toxin associated HUS**
    - **Neuraminidase associated HUS**
  - **Atypical HUS**
  - **Thrombotic thrombocytopenic purpura**

# EPIDEMIOLOGY OF HUS



- HUS occurs most frequently in children younger than 5 years
- The incidence: 5-6 children per 100,000 children population per year, compared with an overall incidence of 0.5 to 1/100,000/yr.
- The most common type of HUS is **Shiga-toxin associated HUS** (90% of pediatric cases) caused by Shiga-like toxin (Stx)–producing *Escherichia coli* (STEC).

# EPIDEMIOLOGY of HUS



- The prevalence of disease has two peaks in fall and summer.
- Many epidemics have been reported from the USA, South Africa and Japan
- E. coli outbreak in Germany in 2011:
  - 3325 cases of HUS, 36 deaths
  - Mortality rate when it is not complicated with HUS: 0.51%
  - Mortality rate when it was complicated with HUS: 2.8%
- Epidemic situation in our country ????
  - In September 2015 (before Feast of sacrifice)

# CLINICAL FINDINGS OF HUS

- **The classical tirad of HUS:**
  - **Microangiopathic Hemolytic Anemia**
  - **Thrombocytopenia**
  - **Acute Kidney Injury**

# TREATMENT OF HUS

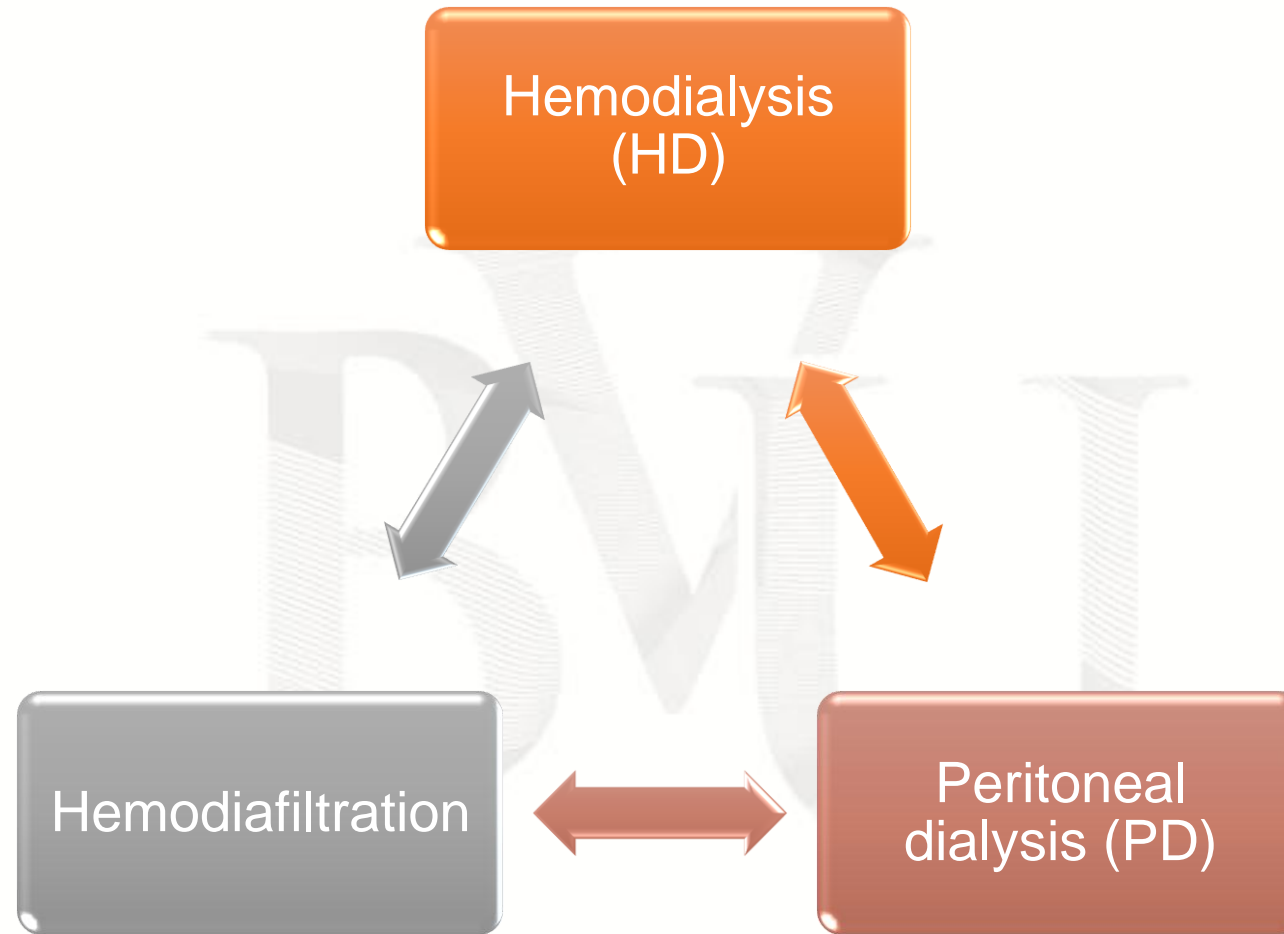


Supportive  
care

Specific  
care

# TREATMENT OF HUS

- **Dialysis ;**





# AIM



- **The aim of this study was to evaluate the characteristics of HUS patients treated in our unit in terms of nursing care.**

# MATERIAL AND METHODS



- Data were collected from patients who had HD, PD or continuous veno-venous hemodiafiltration due to acute kidney injury secondary to HUS between September 1<sup>st</sup> 2015 and October 1<sup>st</sup> 2015.
- The age, number of HD sessions, the duration of PD and outcome were recorded.

# MATERIAL AND METHODS



- **Statistical analysis was conducted using SPSS 17.0 program**
  - **The age of the patients, the number of hemodialysis sessions and the duration of PD were expressed as mean.**
- **Graphics were formed using Microsoft Office Program**

# RESULTS



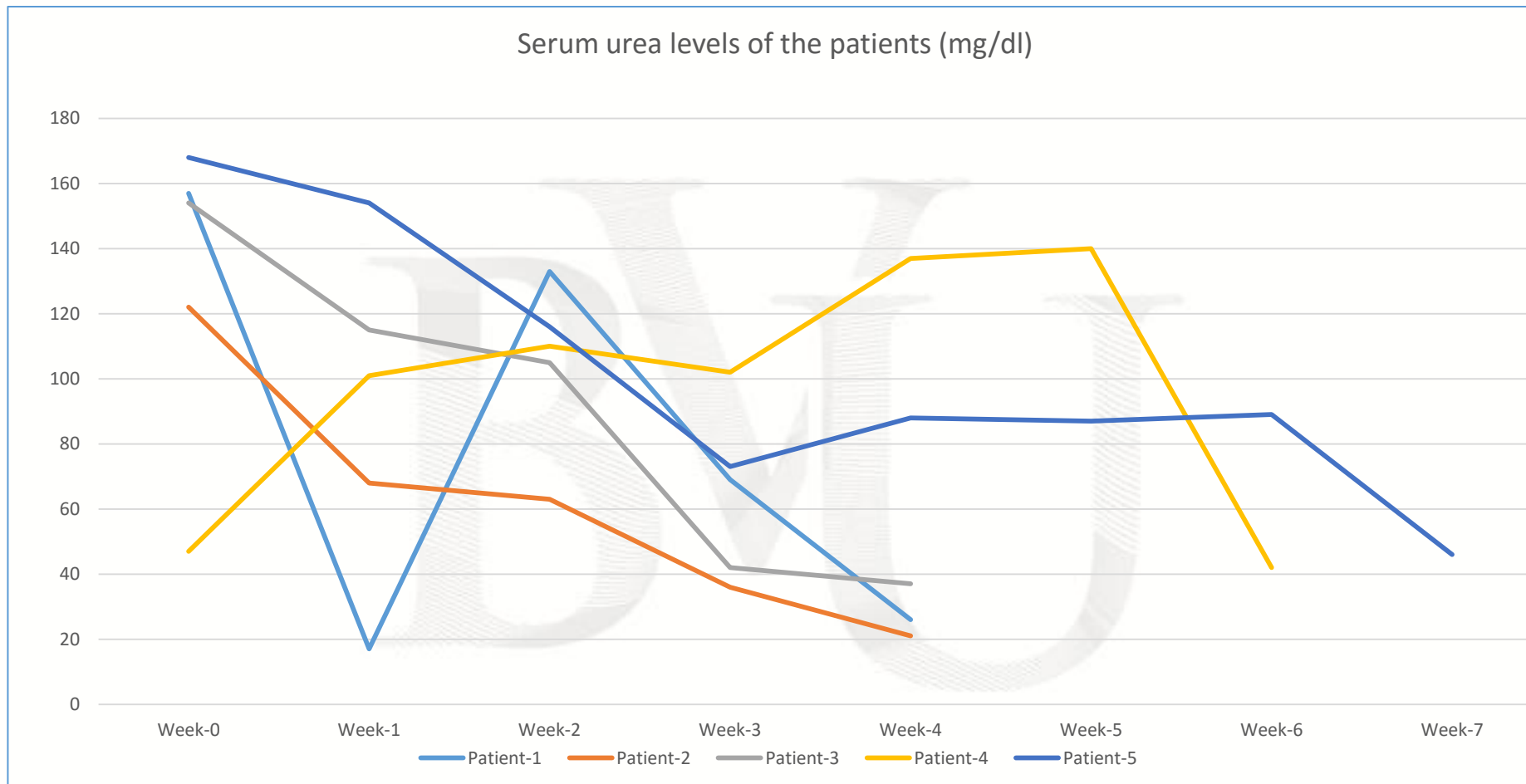
- **Five patients were followed up within this period of time.**
- **All of the patients presented after an acute attack of diarrhea and were accepted to have typical HUS.**
- **The mean age was 6.2 years.**
- **Hemodiafiltration was performed in three patients in intensive care unit followed by automated PD (APD) in two patients and HD in one patient in pediatric nephrology clinic.**

# RESULTS

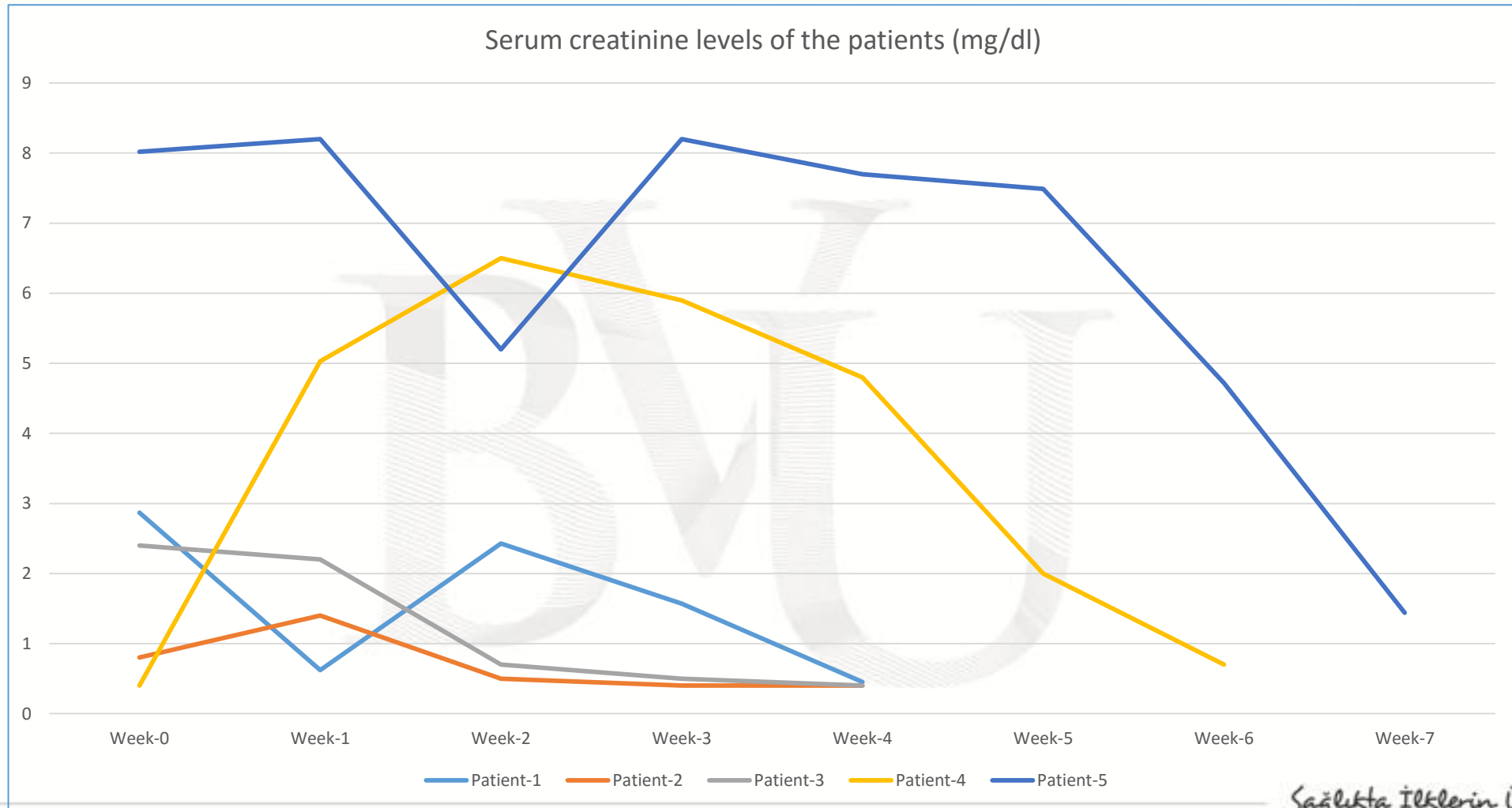


- **One patient had only PD and one patient had only HD treatment.**
- **The number of hemodialysis sessions were 14 and 15.**
- **The mean duration on PD was 9.33 days.**
- **All patients' renal functions improved completely and were discharged from hospital in a good health condition.**

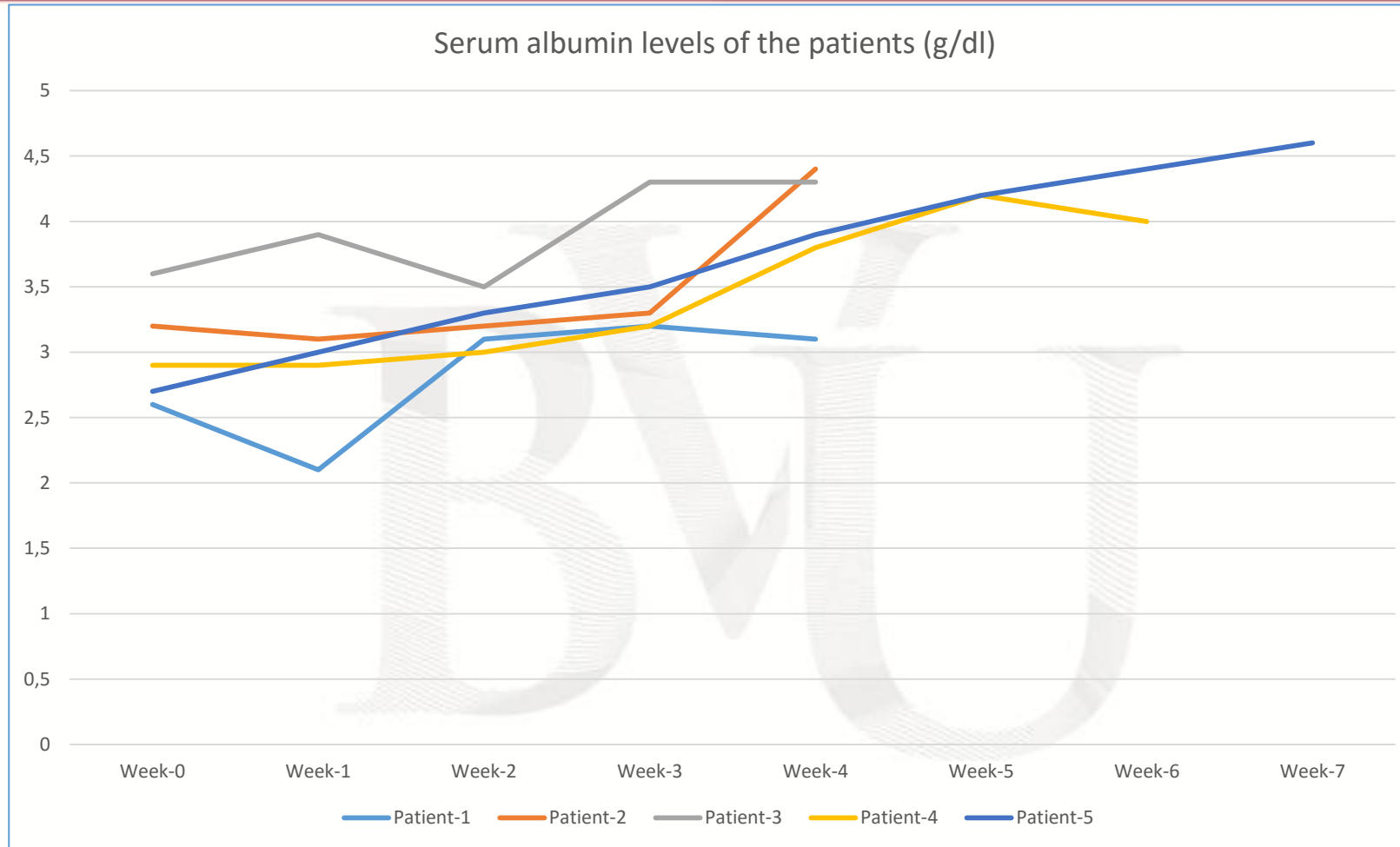
# UREA



# CREATINE

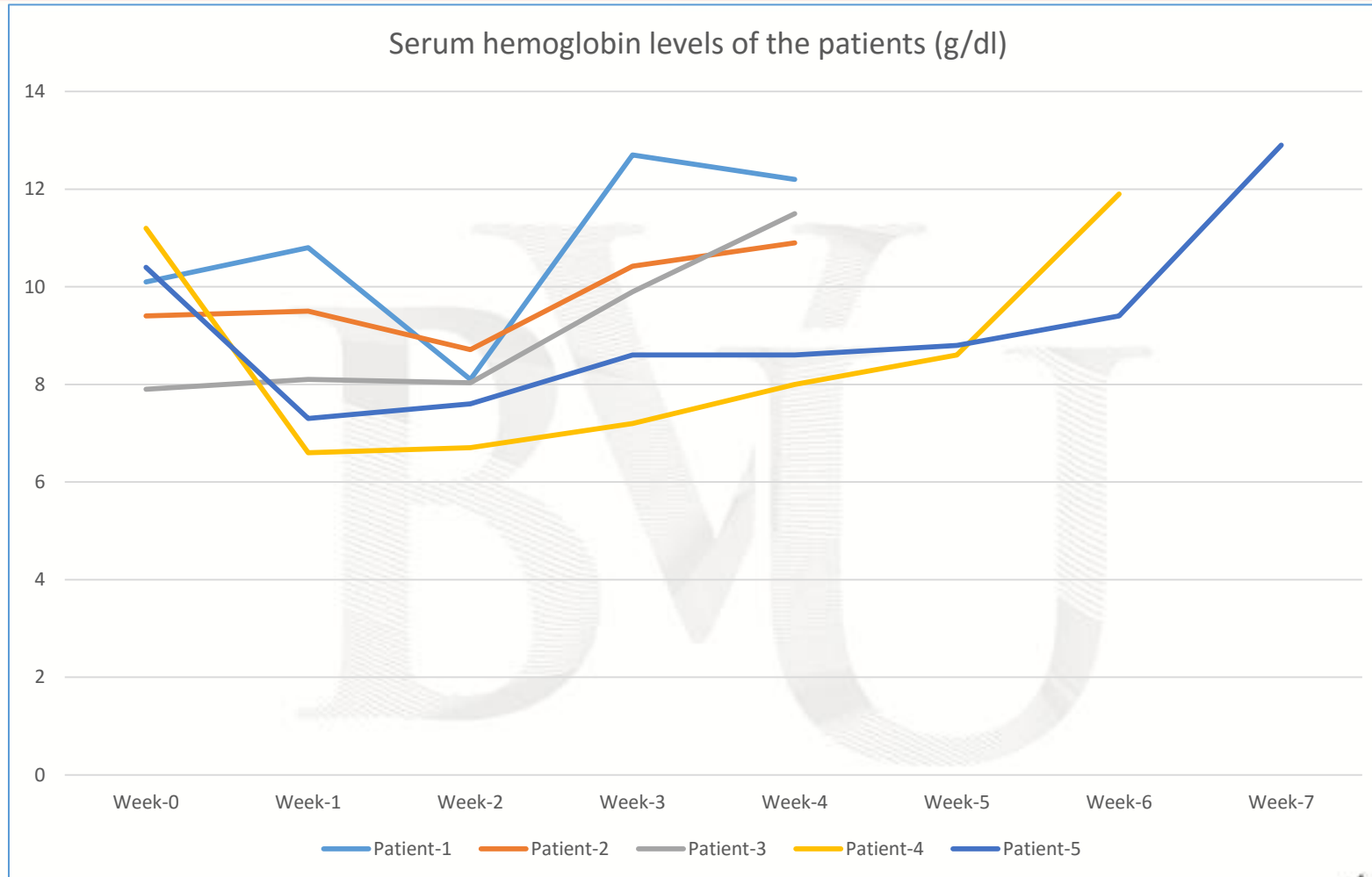


# ALBUMIN

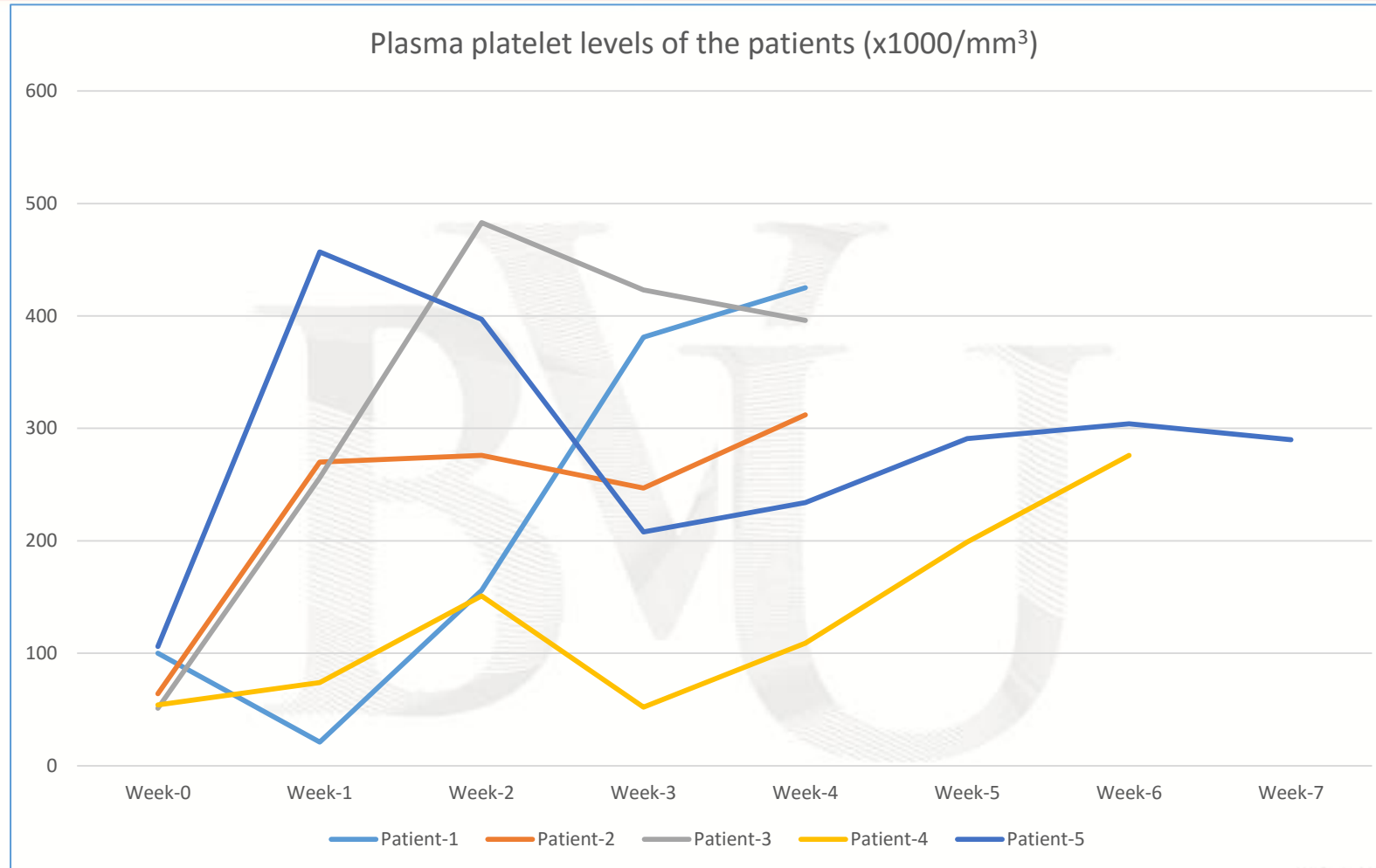




# HEMOGLOBIN

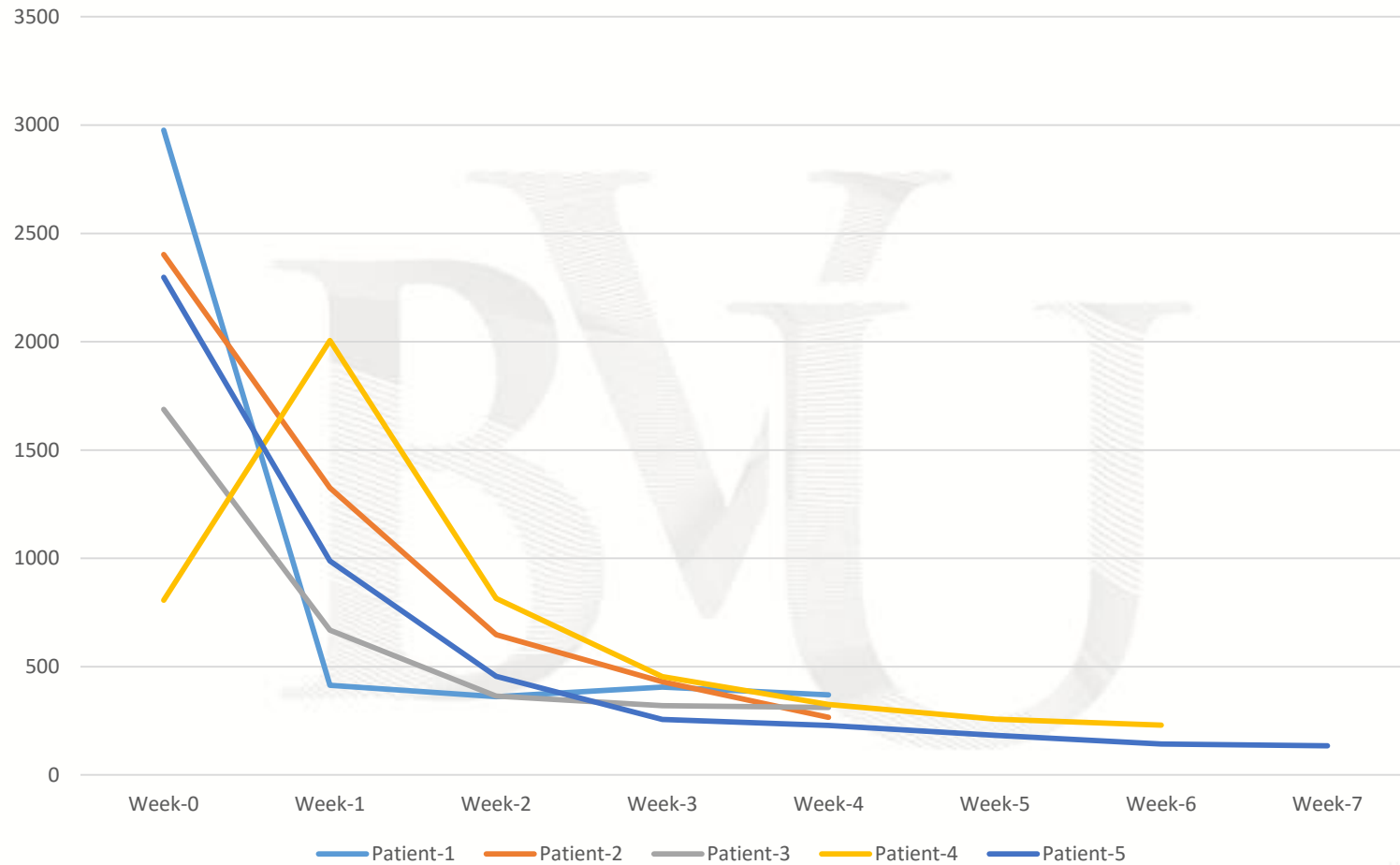


# TROMBOSIT/PLT



# LDH

Serum LDH levels of the patients (mg/dl)



# RESULTS



- Hypervolemia
- Hypotension
- Hypopotasemia
- Hypoalbuminemia
- Fever
- Thrombocytopenia
- Anemia
- Diarrhea
- Anxiety
- Agitation

**Complications  
during HD**

# RESULTS



## Nursing Interventions HD

- Daily consecutive dialysis
- Dialysate K: 3mmol/l
- Albumin infusion
- Anti-pyretic drugs
- Dialysis without heparin
- Blood transfusion
- Ensure adherence to treatment
- Have contact in non dialysis days

# RESULTS



- Hypervolemia
- Hypotension
- Anxiety-agitation
- Trombositemia, anemia
- Hypoalbuminemia
- Hypopotasemia
- Outflow problems
- Exit site infection, peritonitis

## Nursing Diagnosis PD

# RESULTS



## **Nursing Interventions PD**

- 24 hour APD treatment with low volume hypertonic solutions
- Nutritional counseling and educations
- Symptomatic treatment
- Blood transfusion
- Albumin supplement
- Increase patient and family compliance to treatment
- Hygiene training
- Daily exit site care

# DISCUSSION



**All patients have been discharged following removal of their peritoneal and hemodialysis catheters.**

**During follow-up all patients had complete remission.**



# DISCUSSION

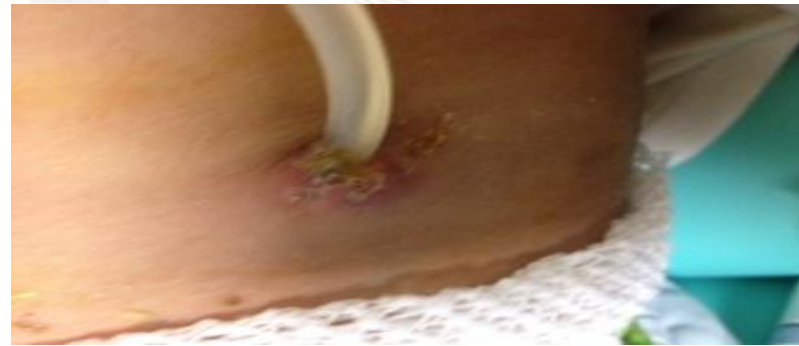
**Nurses have a very important role in the management of acute dialysis in children.**

**Nurses need to monitor vital signs, assess the hydration status, nutritional support, blood sampling, and educate patients and families.**

**So, they should be familiar with the treatment options for hemolytic uremic syndrome.**



**THANK YOU FOR YOUR ATTENTION**



We got permission from families for the pictures.