Evaluation of clinical symptom, laboratory finding and prognosis in thrombotic thrombocytopenic purpura patient from 2010 t0 2017. A single-center retrospective study

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Abstract

Background and purpose: thrombotic thrombocytopenic purpura (TTP) is associated with microangiopathic hemolytic anemia, thrombocytopenia, and micro vascular thrombus plus fever, fluctuating neurologic abnormalities and renal damage. The purpose of this study was to investigate clinical symptom, laboratory finding and prognosis in TTP patient from 2010 to 2017 in Shariati hospital. In the present study we assessed clinical presentation and laboratory finding to predict mortality in patients with TTP.

Methods: the study was a retrospective cohort study in patient with TTP in Shariati hospital from 2010 to 2017. 114 subjects with TTP after rule out of other microangiopathic hemolytic anemia were included in this study.

Results: 114 case of TTP (80 female and 34 male) were identified. Mean ages of participated in the study were 39 years. Hematologic and neurologic symptoms were most common manifestations. Laboratory result at the time of diagnosis revealed mean thrombocytopenia (Plt: 29100), anemia (Hb:8/1), elevated LDH (15100).all patient were treated with PEX, using a cut-off value for the platelet count of 150000/ml. 75% of patient responded . In this study mean of ages, Neurologic manifestation, category of immunologic and reticulocyte count predicted mortality.

Conclusion: finally, it can be concluded that mortality rate similar to other study but: in difference clinical symptom and laboratory finding may be predict mortality and occurrence of relapse.

Introduction:

In recent years, the close relationship between an old disease called thrombotic thrombocytopenic purpura (TTP) and a deficiency in a new protein called ADAMTS13 has been highly regarded (2 and 1). The disease is a rare hematological disease with an annual prevalence of about 10 cases per million and an annual incidence of about one new case per million (3-11). The first acute episode of the disease occurs predominantly during adulthood (which accounts for 90% of patients), but some children and adolescents also experience the initial episode (13, 12). The disease is mainly caused by an autoimmune mechanism but non-autoimmune but familial forms of the disease have also been described (called Upshaw-Schulman syndrome). TTP is twice more common in women than in men, and even recurrence is more common in women. The disease continues to be a fatal disease with mortality of over 10 to 20 percent despite recent advances in treatment protocols (14).

The definition of TTP has changed a lot over time. Early on, the acute episode of TTP was defined on the basis of clinical evidence (mainly visceral ischemic symptoms mainly focused on the brain) as well as standard biological parameters (including microangiopathic hemolytic anemia and severe thrombocytopenia) in the absence of other causes. In this definition, the role of ADAMTS13 deficiency has also been added in recent years, being the only diagnostic marker specific for TTP (14). Severe defect in ADAMTS13 causes the accumulation of von Willebrand factor multimers in the blood resulting in the

formation of platelet-rich microtombuses, especially in the small and distal arterioles (14). In most cases, the mechanism of severe ADAMTS13 defect is explained by the release of autoantibodies against ADAMTS13 mainly during the acute phase of the disease. These anti-ADAMTS13 IgGs antibodies usually inhibit the proteolytic activity of ADAMTS13 against von Willebrand factor, and therefore significant amounts of the circulating immune complex associated with ADAMTS13 or ADAMTS13-ICs are visible in TTP-acquired forms (25).

In clinical presentation, fivefold incidence of fever, thrombocytopenia, microangiopathic hemolytic anemia, neurologic symptoms, and renal insufficiency have been shown to define and diagnose TTP, but many reports have reported incidence of these five in less than 10% of TTP patients (44 and 10). However, persistent signs of the disease, including thrombocytopenia, microangiopathic hemolytic anemia (based on the observation of peripheral blood smears) have maintained their role in the diagnosis. Symptoms associated with ischemia or organ infarction are predominantly brain related, with manifestations of headache, convulsions, stroke and even coma. Cardiac ischemia (in 25% of patients) as well as mesenteric ischemia (in 35%) is seen in patients (45). Symptoms of renal insufficiency in the form of hematuria, proteinuria, although acute renal failure is usually rare, and so acute acute renal failure is sometimes seen in severe cases of TTP up to 10% to 27% (46). Many patients also have symptoms completely unrelated to the pathophysiology of TTP, including bacterial infections or autoimmune diseases (such as SLE), medication use (cyclosporine, quinine, clopidogrel and ticlopidine), HIV infection, puncture, HIV Cancer types noted. In this regard, it is important to pay attention to the specificity or deficiency of ADAMTS13 in TTP to distinguish it from other diseases.

Concerning the prognosis of TTP, the survival rate of patients with TTP has been estimated at 80% to 90% since the first episode of the disease (64). High age, high levels of lactate dehydrogenase (above 10 times the normal level), organ damage associated with the disease, and elevated cardiac troponin levels have all been associated with poor prognosis and failure to respond to treatment (66 and 65). In spite of clinical examinations and normal laboratory tests in some patients, non-recovery following treatment in patients has been described (68, 67). Neurologic deficits, arterial hypertension, and major depression are commonly reported in these patients even after complete treatment. In addition, patients with TTP also struggle with certain connective tissue diseases such as SLE and Sjogren's syndrome. In 40% of patients, patients experience one or more recurrences in the long term (69). It should be noted that evaluation of ADAMTS13 activity was the only important factor in predicting and tracking recurrence even in the long run. Regarding treatment response criteria, complete response to treatment approaches is generally considered in the form of platelet counts above 150 for two consecutive days with normal LDH levels and complete resolution of clinical symptoms. Treatment response is expected at least 30 days after TPE discontinuation. In this regard, refractory disease is defined as exacerbation or recurrence within 30 days or more after treatment protocol.

In a study by Chaturuedi et al., between 2000 and 2012, a cohort study was performed to monitor the outcome of patients with TTP at the Cleveland Clinic. No fever, neurological problem, or renal impairment. Other cases of microangiopathic hemolytic anemia (from DIC, Sebis, Eclamysi, etc.) were excluded.

Patients diagnosed with TTP according to underlying cause in six autoimmune, transplanted, Malignancies were associated with delivery, drug, or idiopathic. Clinical outcomes of treatment in response to It was defined as <15,000 <plt and normal LDH and recurrence was lower than platelets below 15,000 and increased LDH following a defined initial response was assessed and analyzed using the REDCAP tool. All variables were analyzed for outcome evaluation. Classified variables were analyzed with Fisher exact test, Pearson chi square and continuous data with Wilcoxon signed and t-test. P value <0.05 was considered significant in the analyzes. Increased age, especially over 60 years (P = 0.002 CI 95% 2015-23 RR: 0.8,) Severe neurological symptoms (P <0.001 , CI95% -14-80 RR: 18/37 (and high LDH after two-dose plasma exchange predicted mortality (98).

In a 2009 study by N.Frawley et al., A retrospective study entitled thrombocytopenic thrombotic purpura has a high association with recurrence after plasma replacement in a single-center experience, which retrospectively reviewed 400 patients between 2005 and 1992 at the hospital. The patients in this study were defined with microangiopathic hemolytic anemia and thrombocytopenia with or without renal involvement, neurology, and fever. Patients treated with FFP were treated once daily with plasma FFP. Obtained from patients and pathological evidence the goal of not having complete response and recurrence after complete treatment of partial PR response and refractory disease or death during the TTP period was defined. CR was confirmed as platelet and LDH normalization, hemoglobin elevation, and microangiopathy and neurological symptoms except stroke. Sustained CR was defined as non-recurrent within 1 month, and refractory disease was defined as one of the following. Platelets were less than 75,000 either hemolysis or death before one week of treatment, and PR was defined as biochemical and hematologic improvement with platelets above 75,000,000,000 within 2 weeks of treatment. The results of the study showed that 31 patients achieved CR with an average of 11 times plasma and steroid replacement.

Methodology:

Type of Study: This was a retrospective cohort study.

Study population: Patients with TTP referred to Dr. Shariati Hospital during 2010-2010

In the methodology, patients are divided into the following idiopathic and immunologic subgroups, including Lupus, Wegener, and rheumatoid arthritis, in relation to pregnancy from pregnancy to one week after pregnancy and in relation to concussion and medication. Clinical manifestations include hematologic manifestations. Petechiae and purpura, gastrointestinal bleeding, hemoptysis, and neurologic manifestations including seizures, intracerebral hemorrhage, and laboratory manifestations including platelet loss during hospitalization without clinical symptoms, fever and jaundice, and creatinine elevation of more than 3% of basal levels.

Methods: This study was a retrospective cohort study in which the researcher referred to hospital records, telephone calls and face-to-face interviews to evaluate clinical and laboratory symptoms and prognosis of patients with TTP admitted to Dr. Shariati Hospital during 2010. By 1396 he had paid. The researcher

referred to the Plasma Unit of Shariati Hospital after receiving the authorization and introducing a letter from the Vice Chancellor for Research, Shariati University of Medical Education, Research and Therapeutic Center. Data was collected on patients with TTP who were treated at the center. Data collection tools were referral to hospital and clinic records, telephone contact with patients, and face-to-face interviews with patients and their first-degree relatives. Through the above, the researcher gathers information on demographic characteristics, initial tests, clinical symptoms, examination findings, treatments performed, known underlying or later diagnosed diseases, laboratory follow-up, number and The type of treatment performed, the disease resistance and relapse, and ultimately the long-term survival of the patients.

2 Statistical Analysis Method: The results were expressed as mean and standard deviation (mean ± SD) for the quantitative variables and as percentages for the qualitative variables. Data were analyzed using t-test or ANOVA and chi-square test was used to compare qualitative variables. Multivariate logistic regression model was used to determine factors related to patient survival or relapse. Also, the long-term survival of patients was determined using the Kaplan-Meier curve. Significance level was considered less than 0.05. SPSS software version 23 was used for statistical analysis.

Ethical considerations: Patients' private information is kept strictly confidential. There was no disruption in their diagnostic and therapeutic course and no additional cost was imposed on the patient. Any use of patient information was obtained with the permission of the researcher and confirmed by the research assistant of Tehran University of Medical Sciences.

Discussion:

The epidemiological aspects of TTP have been studied in different societies, but the epidemiological features of these patients in Iranian society have not been thoroughly investigated so far. Evaluation of various epidemiological, clinical, diagnostic and also long-term therapeutic implications of patients is essential for macro-planning because the disease is associated with high mortality and disability rates and strongly underpins psychological and quality of life of patients. Overwhelms. What we did in the present study was primarily to evaluate the epidemiological aspects, clinical manifestations, laboratory findings as well as short and long term outcomes of patients with TTP in Iranian society and then to evaluate the relevant and influencing factors. We evaluated the long-term survival of patients and the long-term relapse of the disease in Iranian society. Epidemiologically, we have shown that the sex distribution of TTP in women is far greater than in men (with a ratio of approximately 3 to 1) and the mean age of patients is about 39.3 years, which is quite consistent with reports from other societies. . In Swart et al.'s study, 78.1% of patients were female (91). In the study of Alwan et al., 68% of patients were female and the median age of patients was 46 years (93). In Iqbal et al.'s study, 18 (75%) patients were female and the mean age was 33.5 years (94). In the study of El-Husseiny et al., The female frequency was 56.6% and the median age was 42 years (97). Therefore, in terms of sex distribution as well as middle age, our country was similar to other countries. In terms of clinical presentation, the most common manifestations in our patients included hematologic signs and symptoms, neurological

disorders, as well as routine laboratory manifestations that were consistent with other studies. In the study of Iqbal et al., In general, the most common manifestations included neurological lesions, renal impairment, and TTP diagnostic laboratory triad (94). In the study of Wang et al., Among 14 patients, 14 patients had neurologic symptoms, hemolytic anemia, and decreased platelet count. Eight patients also had fever and eight patients had renal impairment (95). In the study of Sun et al., Common symptoms were thrombocytopenia in 100%, hemolytic anemia in 92.1%, neurologic symptoms in 88.2%, fever in 72.5% and renal impairment in 70.5% (96). In the study of Chaturuedi et al., Diagnostic symptoms included microangiopathic hemoptic anemia, thrombocytopenia with or without fever, neurological problems, or renal impairment (98). Therefore, in all TTP patients, the occurrence of microangiopathic hemolytic anemia associated with thrombocytopenia, neurological disorders as well as renal disorders will be prominent findings.

Regarding the therapeutic approaches planned for patients, almost all TTP patients receive either plasma or PEX replacement therapy, and supplemental treatment with steroids or rituximab is also considered to reduce the effects of PEX. In our patients, all were treated with PEX and also 10.5% of patients received rituximab. This treatment approach had a favorable outcome as far as response rate to treatment and recovery rate, complete recovery in 63.2%, partial remission in 12.3% and no remission in 24.6% were reported. On this basis, the overall rate of recovery after treatment was estimated to be 75.5%. Also, the prevalence of recurrence was estimated to be 21.1%. Overall, the prevalence of mortality was estimated to be 26.3%, which is consistent with studies in other communities. In Swart et al.'s study, primary disease treatment included PEX in 87.8%, plasma infusion in 78.1%, antiviral treatment in 78.3%, steroids in 61%, admission to intensive care unit in 41.5%, dialysis Kidney was 12.2% and other immunosuppressive drugs was 4.9%. The recurrence rate after treatment was 9.8% and the mortality rate was 29.3% (91), which was very close to the results of our study. In the study of Alwen et al., Mortality rate was 10.3%, which was less reported than in our study (93). In the study of Iqbal et al., All patients received PEX, 95.8% had steroids, and 54% had received ritoximab. Complete recovery was reported in 87.5%. At the 22-month follow-up, 83.3% were life-threatening, and the mortality rate was estimated to be 16.7%, which was slightly lower than our study (94) because in our center Ritoximab used lower due to lack of financial support. In Wang et al.'s study, after treatment with PEX, steroids, and rituximab, 85.7% of patients were successfully treated and 14.3% died, but what was of particular interest in their study was the high incidence of two-year relapse in patients It was 66.7% (95). In the study of Sun et al., PTE treatment was associated with response in 72.3%. Among 36 patients, 22.2% had recurrence and 29.4% had died (96), which was very close to our results. Therefore, what our study showed was a significant improvement in patients over the long term and a decrease in the recurrence rate.

Finally, what we found in our study was that factors predicting long-term survival of patients included older age and the appearance of neurological manifestations. Also, in predicting long-term recurrence, lower age, immunological origin for the disease, and decreased platelet count were predictive factors for long-term recurrence in patients. Various studies have been reported to predict mortality and recurrence. In the study of Staley et al., Failure to normalize platelet counts increased LDH levels, decreased protein or albumin levels, and increased serum troponin levels were predictors of mortality (92). In the study of

Alwan et al., Mortality rate was associated with increased levels of anti-ADAMTS13 antibody and decreased ADAMTS13 antigen (93). In El-Husseiny et al.'s study, predictors of recurrence of disease included decreased platelet count and increased LDH levels (97). In Chaturuedi et al.'s study, increasing age, especially over age 60, severe neurologic symptoms, and elevated LDH after two-second plasma exchange were predictive of mortality (98), which is consistent with our study.

In the study of N.Frawley et al., Neurological symptoms were the only predictor of treatment failure (99). In this study, however, we focused on epidemiological and clinical factors rather than laboratory and diagnostic findings. Therefore, in summing up the factors associated with first-line treatment failure and therefore predicting long-term mortality and recurrence, in addition to age factors, neurological complications, underlying immunological abnormalities, significant reduction in platelet count as well as reticulocytes as well as reduction ADAMTS13 activity and elevated serum LDH levels should be considered at a glance. Therefore, a set of new scoring systems for predicting outcome or outcome of patients can be used in combination of these factors.

Results And Findings:

Basic characteristics of patients with TTP:

In this study, a total of 114 patients with TTP were studied. In terms of sex distribution, 80 cases (70.2%) were female and 34 cases (29.8%) were male. The mean age was 39.3 + 14.9 years ranging from 21 to 84 years. In total, 83 patients (72.8%) were outpatient and 31 cases (27.2%). In terms of disease classification, 47 (41.2%) were idiopathic, 21 (18.4%) pregnancy-type, 31 (27.2%) immunologic, 7 The case (6.1%) was followed by transplantation, in 6 cases (5.3%) it was cancerous and in 2 cases (1.8%) it was drug induced. In terms of disease manifestations, hematologic manifestations in 64 cases (56.1%), neurologic manifestations in 24 cases (21.1%), routine laboratory manifestations in 22 cases (19.3%), jaundice in 2 cases (1.8%) %), Fever in 1 case (0.9%) and increased creatinine level in 1 case (0.9%). In terms of laboratory presentation, mean hemoglobin was 9.58 ± 8.65 g / dl, mean creatinine was 1.77 ± 1.55 mg / dl, mean LDH level was 189.89 ± 1293.77 mg / dl. , Mean Schistosite count was 5.03 /1 1.27, mean platelet count was 36491.23 + 25836.53 mm3, mean AST level was 60.41+56.24 mg / dl, mean ALT level was 94.64+-2.76 mg / dl, mean total bilirubin level was 2.76 +2.29 mg / dl and mean direct bilirubin level was 2.76 ± 2.28 mg / dl. Mean reticulocyte count was 5.43 + 3.79. In the treatment protocol, all patients underwent PEX over an average of 16.61 rounds. Also, 12 (10.5%) patients received rituximab. Three patients received vincristine in total.

3.2.2 Outcome information for patients with TTP:

In terms of response to treatment and recovery, complete remission was reported in 72 cases (63.2%), partial remission in 14 cases (12.3%) and no remission in 28 cases (24.6%). On this basis, the total recovery rate after treatment was estimated to be 86 (75.5%). The incidence of recurrence was estimated to be 24 (21.1%) in total. Overall, the prevalence of mortality was 30 (26.3%). Mean CR was 31.17 ±31.34 months, mean platelet count normalization time was 15.24 ±18.42 days and mean recurrence time was 10.56 + 28.57 months.

3. Calculating the survival of patients with TTP:

Based on Kaplan-Meier curve analysis of survival, 30-day survival was 82.5%, 76.3% one-year survival, 74.6% two-year survival, and 73.7% three-year survival. Five years was 2.71%. In terms of recurrence-free survival, 6-month recurrence-free survival was 93.8%, one-year recurrence-free survival equal to 89.3%, two-year recurrence-free survival equal to 89.3%, and three-year recurrence-free survival equal to 6. 85.5% and five-year recurrence-free survival were 2.83%.

Determination of Predictors of Mortality in Patients:

In both groups, the frequency of death was 60 (71.4%) and 20 (66.7%), respectively (P value = 0.625). The mean age of the two groups was 34.89 +10.14 years and 51.67 + 19.17 years, respectively, which was significantly higher in the deceased group (P value less than 0.001). According to the distribution of disease category in the two groups, the prevalence of idiopathic type was 39 cases (46.4%) and 8 cases (26.7%) respectively, the frequency of pregnancy type was 20 cases (23.8%).) And 1 case (3.3%), frequency of immunological type was 20 cases (23.8%) and 11 cases (36.7%), frequency of transplant type was 3 cases (3.6%) and 4 cases (3 cases). (13%), malignant type was 0 (0%) and 6 (20%) and the frequency of drug type was 2 (2.4%) and 0 (0%), respectively. There was a significant difference between the two groups in that the frequency of malignancy was significantly higher in the deceased group (P value less than 0.001). In terms of clinical manifestations, the incidence of neurologic manifestations was 12 (14.3%) and 10 (40.0%), respectively (55.5%) in both groups. And 9 cases (30%), jaundice occurrence 0 (0%) and 2 cases (6.7%), fever occurrence 0 (0%) and 1 case (3.3) %), Laboratory presentation was 16 (19%) and 6 (20%) and creatinine increased 1 (1.2%) and 0 (0%), respectively, indicating higher prevalence. Neurologic manifestations were higher in patients (P value <0.001). In the group of deceased patients, mean hemoglobin was 8.13 +1.79 and 10/10 ± 9.98 (P value = 0.228), mean creatinine was 2.13 + 1.34 and 0.60, respectively. 1.6 1 1 (P value = 0.146), mean LDH was 2296/60+ 1513.03 and 2112.78 + 1213.83 (P value = 0.601), mean platelet count was 34100/00+29520/71(P value = 0.557), AST mean 50.5 ± 31.8 and 63.8 + 62.5 (P value 0.27), ALT mean 94.64 ±57.92 (P value 0.372), mean total bilirubin 2.76 ±1.88 and 2.76 ±2.31 (P value 0.986) The mean reticulocyte count was 4.2±3.4 and 5.8 ± 3.8 (P value = 0.034), which only showed a difference in reticulocyte count. The convenience was between the two groups. Ritoximab was 9 (11.0%) and 3 (11.1%), respectively, with no significant difference (p value = 0.945). According to Cox Proportion Hazard Model, two factors of high age (P value = 0.001) and appearance of neurological manifestations (P value of 0.001) were two predictors of long-term mortality in patients.

Determination of Predictors of Recurrence:

In the two groups with and without recurrence, the frequency of female was 20 (83.3%) and 60 (66.7%), respectively (P value = 0. 113). The mean age of the two groups was 32.46 9 9.54 years and 41.13 15 15.68 years, respectively, which was significantly lower in the relapsed group (P value = 0.011). According to the distribution of the disease in two groups with and without recurrence, the frequency of idiopathic type was 10 cases (41.7%) and 37 cases (41.1%) respectively, the frequency of pregnancy type was 2 cases (8.3%) and 19 cases (21.1%), frequency of immunologic type was 12 cases (50%) and 19 cases (21.1%), transplant type frequency equal to 0 cases (0.2%) and 7 cases (7.8%). %), Malignant type was 0 (0.2%) and 6 (6.7%), and drug-induced frequency was 0 (0.2%) and 2 (2.2%), respectively. There was a significant difference between the two groups in the frequency of relapsed immunologic type (P value = 0.042). In terms of clinical manifestations, the frequency of neurologic manifestations was 6 (25%) and 18 (20%) respectively, in the two groups with and without recurrence, hematologic involvement was 16 (66.7%) and 48 cases (53.3%), jaundice occurrence 0 (0.2%) and 2 cases (2.2%), fever occurrence 1 case (4.2%) and 0 cases (0.2%) Laboratory presentation was equal to 1 (4.2%) and 21 (23.3%) and creatinine increased to 0 (0.2%) and 1 (1.1%), respectively, indicating no difference between the two groups. Was (P value 0.10). In the group of patients with and without recurrence, mean hemoglobin was 8.26 +2.25 and 9.94 + 9.64 (P value 0.402), mean creatinine was 1.76 +1.91 and 1.45%, respectively. 1.78 (P value = 0.966), mean LDH was 1929.04 + 1929.04 and 2525.45 + 1361.20 (P value = 261.26), mean platelet count was 2106.61818.45 And 40611 ± 11/25993 82/82 (P value 0.001), AST mean 63.62 + 65.53 and 59.55 + 53.88 (P value 0.754), ALT mean 77.3+ 49.0 + 49.6 ± 99.0 (P value 0.609), mean total bilirubin 2.7 +2.5 and 2.7 +2.2 (P value 0.949) and mean The reticulocyte count was 7.9 + 4.9 and 6.7 + 3.1 (P value = 0.123), which only showed a difference in platelet count between the two groups. It was Roe. Ritoximab was 1 (4.3%) and 11 (12.8%), respectively, with no significant difference (p value 0.148). According to Cox Proportion Hazard Model, three factors of low age (P value 0.042), immunological category (P value 0.003) and decrease in platelet count (p value 0.001) are predictors of long-term recurrence. The duration was in patients. Table 1 lists the predictors of mortality TTP patient in our study.

Predictors of TTP Death

Factor	Beta multiplier	standard deviation	Probability ratio	P value
Older age	0.056	0.020	1.058	0.006
Malignant Cause	516/20-	611/1	0.001	0.999
Neurologic manifestation	588/1-	0.603	0.204	0.008
The reticulocyte count	102/0-	0.092	903/0	0.263

Table 1: Predictors of TTP Death in our study

Conclusions:

As a final conclusion, in our study, first, the epidemiological and clinical distribution of TTP patients was entirely in line with studies published by other communities. The first-line treatment of patients with TTP including PEX and rituximab had complete remission of 63.2%, partial remission of 12.3% and total remission of 75.5% in our population. However, recurrence was about 21.1% and long-term mortality equivalent to 26.3%. Long-term mortality in these patients was predictable with factors such as old age and the appearance of neurologic manifestations, whereas younger patients, patients with immunologic disease, and patients with low platelet counts were at greater risk for long-term recurrence. They were facing a long time.

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Declarations

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Four bullet points:

Background: thrombotic thrombocytopenic purpura (TTP) is   associated with microangiopathic hemolytic anemia, thrombocytopenia, and micro vascular thrombus plus fever, fluctuating neurologic abnormalities and renal damage.

Method: The study was a retrospective cohort study in patient with TTP in Shariati hospital from 2010 to 2017. 114 subjects with TTP after rule out of other microangiopathic hemolytic anemia were included in this study.

Results: 114 case of TTP (80 female and 34 male) were identified. Mean ages of participated in the study were 39 years. Hematologic and neurologic symptoms were most common manifestations. Laboratory result at the time of diagnosis revealed mean thrombocytopenia (Plt: 29100), anemia (Hb:8/1), elevated LDH (15100).

Conclusion: in difference clinical symptom and laboratory finding may be predict mortality and occurrence of relapse