ANALYSIS OF BLEEDING AND CLOTTING TIME AMONG PATIENTS VISITING A PRIVATE DENTAL HOSPITAL - An Institutional study

Running title : Diagnosis of bleeding and clotting time in patients visiting the dental hospitals

ABSTRACT:

Introduction: Detection of dental infections starts from childhood, with regular check-ups to the dental specialist. Hemostasis is a stoppage of bleeding from damaged veins which includes a few number of endothelial cells from vessels, little venules, or arterioles, then platelet plug is formed and eventually the bleeding stops.

Aim: The main aim of this study is to analyse the Bleeding time and Clotting time among the patients visiting the private dental hospital.

Material and methods: This study was based on the comparison of bleeding and clotting time among the patients. Samples were collected from DIAS of 3428 patients. SPSS software had been used in the analysis and the results were described in the pictorial graphs.

Results: Among the total patients, 41.45% of them were males and 58.55% of them were females. It was observed that the females had a higher percentage of both bleeding time (1min 21 sec) with p=0.402 and clotting time (6min11sec) with p=0.300 compared to males. However, this was not statistically significant, as the chi square test showed $p > 0.05$.

Conclusion: Dentists are facing a consistently increasing number of conditions associated with abnormal hemostatic function. In this study, it is found that females have more bleeding and clotting time as compared to males due to the hormonal differences.

Keywords: Bleeding time, Clotting time, thrombosis,extraction, innovative technique and novel method.

INTRODUCTION:

In the general population, detection of dental infections starts from childhood, with regular check-ups to the dental specialist (1)(2). But for a person with bleeding and clotting defects, it

becomes a subsequent delay in the diagnosis and management of the diseases. The connection between bleeding time, clotting time, is significant in certain clinical conditions like epistaxis, surgery, extraction and thrombosis (3). Hemostasis is a stoppage of bleeding from damaged veins which includes a few endothelial cells from vessels, little venules, or arterioles, then platelet plug is formed and eventually the bleeding stops (4–6). Assessment of hemostasis is an important factor for surgeons and anaesthetics before undertaking any surgery. Consequently it is a routine preoperative test for hospitals (7,8). In normal individuals, coagulation and fibrinolysis balance each other to prevent unnecessary discharge or thrombosis (9,10). Henceforth, bleeding time (BT) and clotting time (CT) are done for blood transfusion for various purposes and to diagnose various disorders of functions of platelets and clotting factors.

BT is the time taken from the puncture of the blood vessel to the stoppage of the bleeding (11,12). Bleeding normally lasts for 2–6 min. It is increased in females because of the presence of estrogens which lessen the functions of platelets (13,14). BT is diminished in males because of increased enactment and aggregation of platelets (15,16). BT depends on various factors such as functions of platelets and endothelial cells of arteries and pathways of coagulation (17)(18).

CT is the time interval from the cut of blood vessels to the formation of fibrin string. Typical value of CT is 3–8 min (19,20)(21). CT is increased because of the nonappearance or anomaly of clotting factors. CT is higher in females and this is because of increased estrogen in females which delays CT and diminishes plasma fibrinogen level (22,23). Dental procedures, like extractions and periodontal surgery, are among the most widely operated invasive procedures. Numerous dental methods are associated with postoperative bleeding, which, in many cases, becomes the risk factors especially in patients associated with bleeding and clotting disorders (24). The dental management of individuals with bleeding and clotting disorders must be considered not just the usual and seriousness of the problem, yet also, the type, area and extent of the intervention. The risk of the intervention will rely upon the surgical site for the control of hemostasis. For instance, simple exodontia typically permits prepared sites for the postoperative discharge for application of hemostatic measures, like pressure or topical agents (25)(26). Not exclusively is the nature and area of the surgery procedure to the potential for local or systemic management, yet injection of local anaesthetic presents a high degree of risk. Nerve-block infusions (inferior alveolar and posterior superior alveolar) can cause airway obstructions. The high risk is introduced in the inferior alveolar nerve block situa-tion, such dangers from

mandibular blocks can be decreased by utilizing the Gow-Gates Technique (27)(28). Our team has extensive knowledge and research experience that has translate into high quality publications (29),(30),(31),(32),(33),(34),(35),(36),(37),(38),(39),(40),(41),(42),(43),(44),(45),(46),(47),(48). Thus the main aim of this study is to analyse the Bleeding time and Clotting time among the patients visiting the private dental hospital in chennai.

MATERIALS AND METHODS:

This is an institutional study which was performed in a university setting where the required data of the patients were analysed with the bleeding and clotting time in a private dental hospital. It was collected from the record management software and the analysis of n = 3428 patients. The collected data was tabulated in Microsoft excel. The ethical approval of the current study was obtained from the institutional ethical board (Ethical approval number: SDC/SIHEC/2020/DIASDATA/0619-0320). To minimise the sampling bias, collection of data was done by simple random sampling methods with the university. There was high internal validity and low external validity. This study included patients with bleeding disorders, epistaxis and incomplete, censored and repeated data were excluded from the study.

The tabulated data was imported to SPSS software (statistical package for social studies) version 22.0 (IBM corporation) for statistical analysis. SPSS software had been used in the analysis and the results were described in the pictorial graphs.

RESULTS:

In the current study, it included 12 years and above age groups and the sample size was n=3428 patients. 41.45% of people were males and 58.55% were females (Figure:1). The analysis of bleeding time with gender showed that females 23.94% had bleeding time of more than 1 min 21sec (Figure:2). The chi square test, the p value was found to be P=0.402, P >0.05, which was statistically insignificant. The analysis of clotting time with females 40.23% of people had more clotting time 6min11sec (Figure:3). By doing the Pearson's chi square test, the p value was found to be P=0.300, P >0.05, which was statistically insignificant.

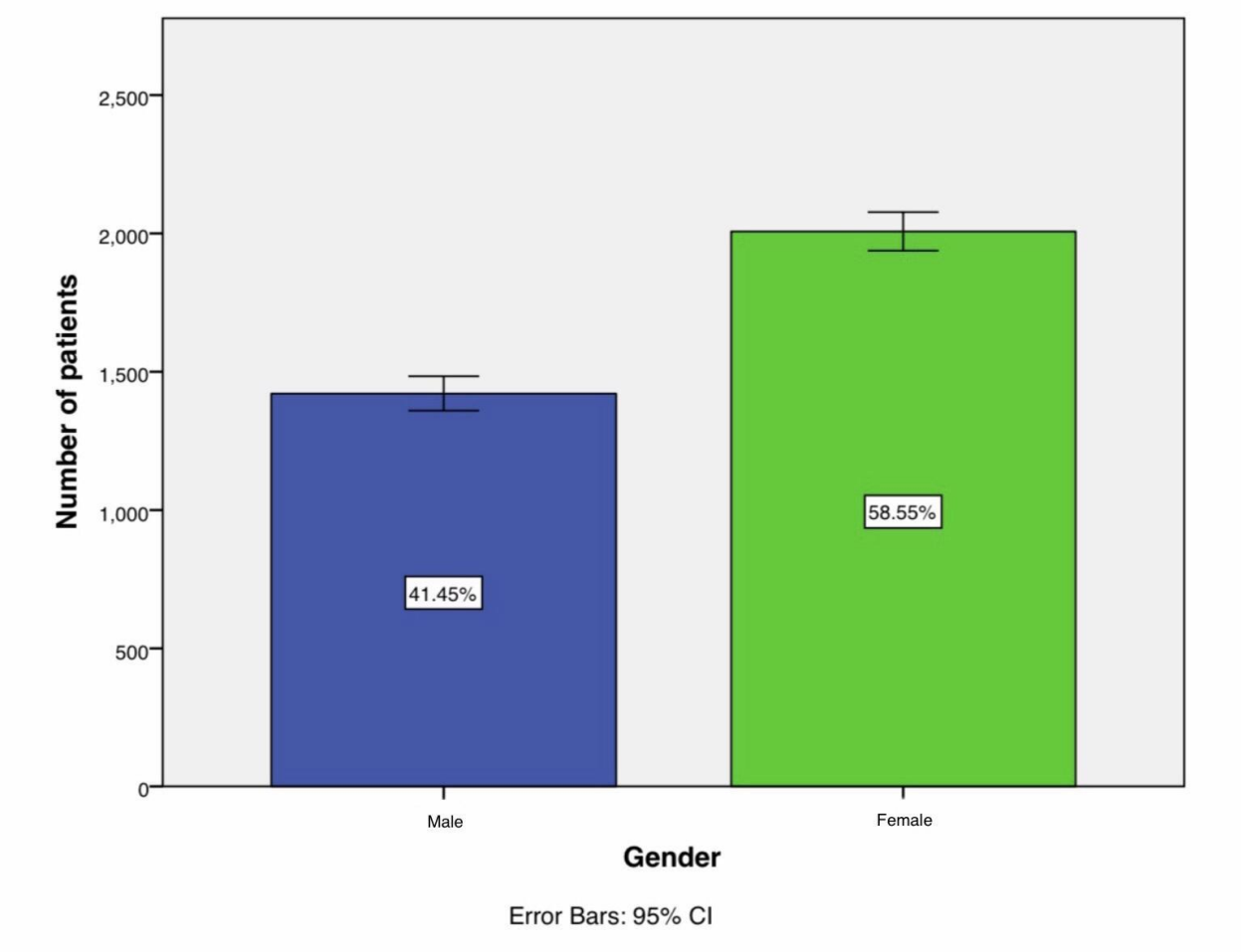

Figure 1: The graph represents the gender of distribution of the participation. The X axis represents the gender of the participants and the Y axis represents the percentage of patients. It includes the female population as 58.55% (Green) and male population as 41.45% (Blue).

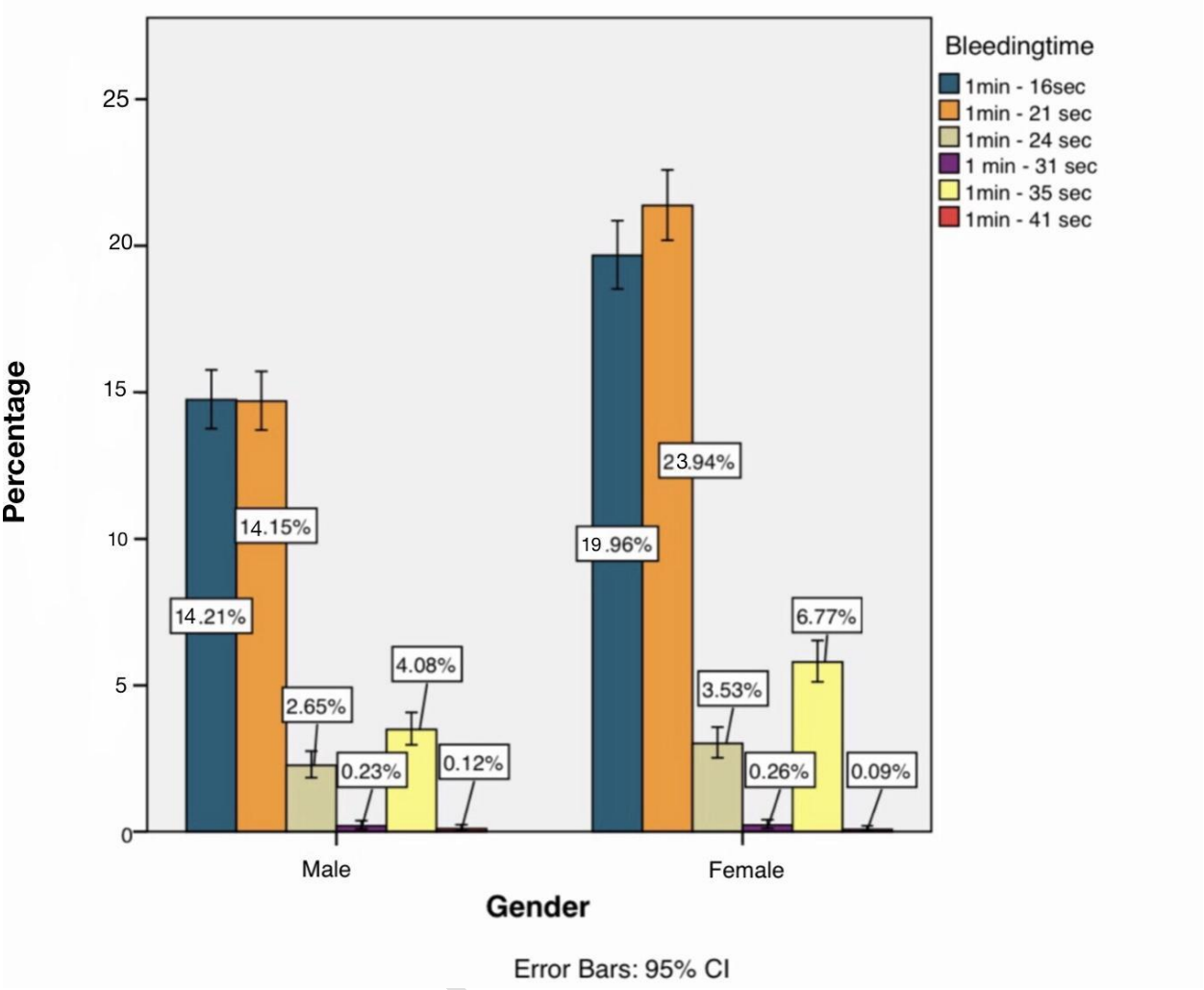

Figure 2: The graph shows the association between the gender and the bleeding time of the patients visiting the dental institution. The X axis represents the gender of the participants and the Y axis represents the percentage of the bleeding time. In this graph, the blue colour represents 1min 16sec BT and orange colour represents the 1min21sec BT and grey colour represents the 1min24sec BT, violet colour represents the 1min31sec BT, yellow colour represents the 1min 35sec BT and red colour represents the 1min 41 sec BT. Pearson's chi square test, P value - 0.402, P >0.05, statistically insignificant, providing females (23.94%) with higher percentage of Bleeding time than males (14.21%).

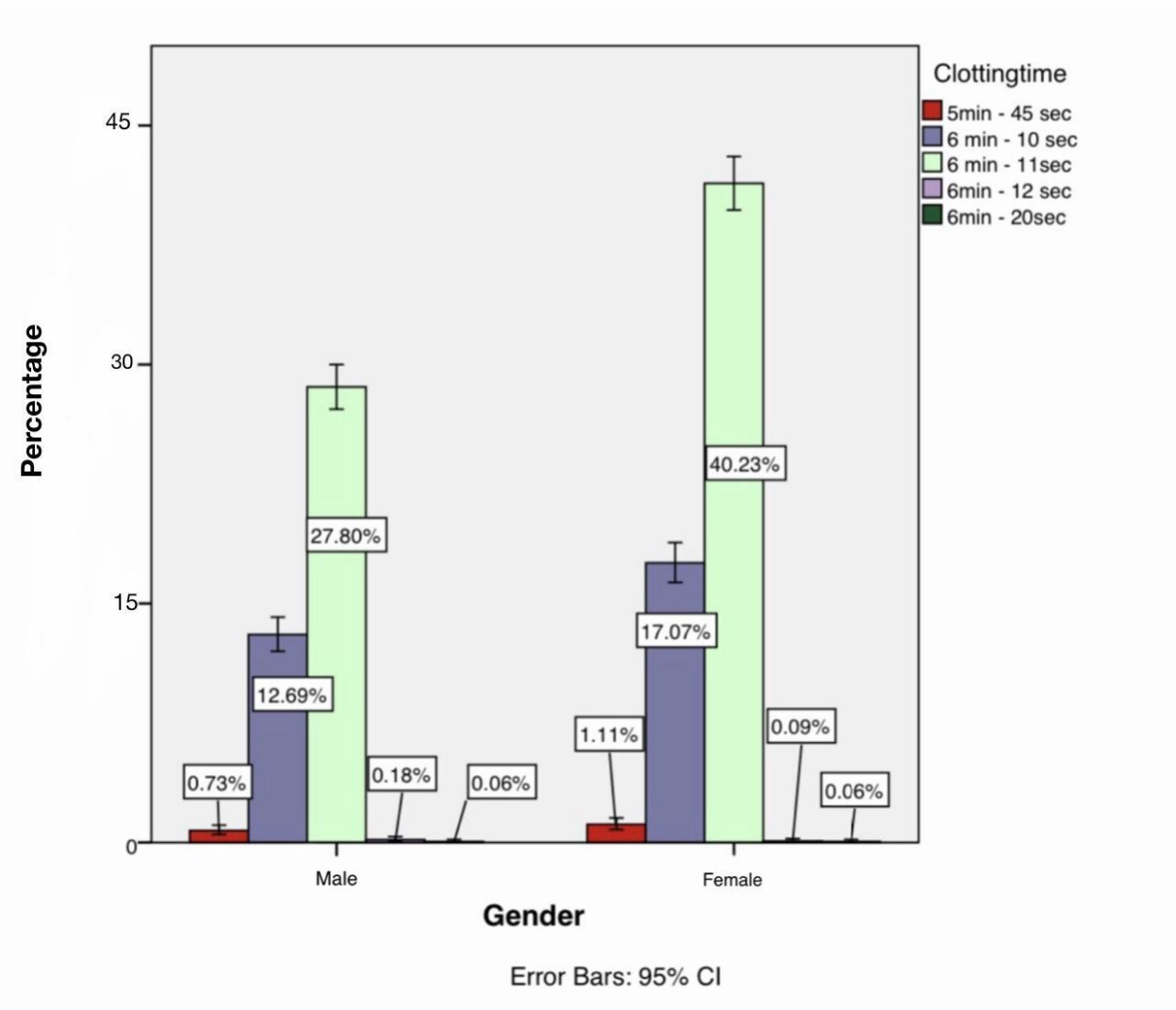

Figure 3: The graph shows the association between the gender and the clotting time of the patients visiting the dental institution. The X axis represents the gender of the participants and the Y axis represents the percentage of the clotting time. In this graph, the red colour represents 5min 45sec CT and lavender colour represents the 6min10sec CT and green colour represents the 6 min 11sec CT, violet colour represents the 6min 12sec CT, green colour represents the 6 min 20sec CT. Pearson's chi square test, P value - 0.300, P >0.05, statistically insignificant, providing females (40.23%) with higher percentage of clotting time than males(27.80%).

Hemostasis comprises two stages, one is a vascular (platelet) stage and the other is coagulation stage. The action of first stage can be checked by the parameters like bleeding time, platelet

count and platelet function assay while the accessible test to check the second phase (Coagulation stage) incorporate clotting time (whole blood), prothrombin time, plasma fibrinogen and activated plasma thromboplastin time (49,50). Some diseases are also related to blood groups. Like in Hemophilia bleeding time remains normal because the platelet adhesion and aggression are the main cause.

In our study, by correlating the gender, females had more CT (6 min 11sec) and BT (1 min 21sec) as compared to males which might be because of hormonal differences in male and females. Females have higher levels of oestrogen and lower levels of fibrinogen in blood plasma as compared to males. This may cause the difference of bleeding time and clotting time in male and females. Tests done by Mahapatra et al express that CT was prolonged out in blood group B compared with O group and BT was significantly higher in AB group17. Mahapatra et al reported that there was no gender wise distribution in BT and CT (51,52).

Continuing with most dental procedures, if INR ≤ 3.5 has been suggested, although some investigation proposes that bleeding or clotting risk doesn't connect with the INR (53). Patients receiving prophylactic doses of either unfrac-tionated heparin or LMWH are allowed to continue with dental surgery without stopping their prophylaxis. Patients accepting therapeutic LMWH may need to give up the doses before dental surgery and restart following the procedure. There is less information about the danger of antiplatelet drugs, although 1 little investigation of patients taking 100 mg of aspirin a day showed no expanded danger of bleeding following dental extraction compared with control patients. Thus it is suggested to continue aspirin during the dental extractions (54)(55).

The limitations of our study is unicentered with a limited demographic area of smaller sample size. By investigating the bleeding clotting time and it’s association with dental implications might help broaden existing knowledge about epidemiology of the dental diseases and also to improve our clinical management to minimize false interpretations.

CONCLUSION:

In the last decades, many studies showed a remarkable level of complexity related to the hemostatic process. Cellular and dissolvable components act in an exceptional way to stop blood

loss quickly at the site of injury. Dentists are facing a consistently increasing number of conditions — acquired, inherited and drug-related — associated with abnormal hemostatic function. These raise the chance of unnecessary blood loss, poor wound healing and infections. In this current study, it is found that females have more bleeding and clotting time as compared to males due to the hormonal differences. The finding of bleeding and clotting time is very much helpful in systematic evaluation of patients having blood related disorders and those with increased and decreased functions. The dental specialist should be ready to manage intraoperative haemorrhages, to happen, in a quiet and effective way.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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