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EFFECTIVENESS OF LIDOCAINE AND ADRENALINE-SOAKED GAUZE VS NORMAL SALINE-SOAKED GAUZE IN MANAGEMENT OF PRIMARY POST EXTRACTION BLEEDING

Dentistry

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ABSTRACT

Objectives: To compare the effectiveness of lidocaine with 1:100000 adrenaline-soaked gauze and normal saline soaked gauze in management of primary post extraction bleeding **Methods:** Patients that are candidates for dental extraction are chosen for this study who match the inclusion criteria. Under Local anaesthesia, dental extraction carried out as per protocol of the department. Patients were divided into two groups, Group E and C and the selection was single blinded. The extractions were carried out by a single operator. In the EXPERIMENTAL GROUP (n = 50) Pressure gauze soaked in LA solution (Lidocaine with 1:100000 adrenaline) placed in the extraction socket immediately post extraction for haemostatic control and in the CONTROL GROUP (n=50) Pressure gauze soaked in normal saline placed over the extraction socket. For both groups, time of placement of gauze noted. (Ta0) Gauze is reflected and status of haemostasis is checked every 5 mins for 20 minutes. (Tax = Ta1/Ta2/Ta3/Ta4) Time of stoppage of bleeding i.e., achievement of haemostasis is noted. (Tax)Time interval (Ta = Tax-Ta0) is measured and readings were tabulated and a statistical analysis was done to check for significance. **Results:** Total number of participants recruited for study is 100, of which 50 were male and 50 were female. P-value obtained (0.363)>0.05 -> statistically not significant.95% confidence interval = -01:52 - +04:52 was proved to be statistically not significant. There was no statistical difference between the meantime interval for management of primary post extraction of the two groups. **Conclusions:** Thus, we can safely conclude that lidocaine with 1:100000 adrenaline-soaked gauze was not an ideal haemostatic agent for control of post extraction bleeding. Many alternate options clinically effective options are available for this the purpose of haemostasis after dental extraction.

KEYWORDS

INTRODUCTION:

Tooth removal or extraction is one of the most common minor surgical procedures performed in routine dental practice and post extraction bleeding (PEB) is a recognised, frequently encountered complication. Post extraction bleeding can be categorised into 3 groups: Primary, Reactionary And Secondary Primary post extraction bleeding (or) oozing occurs during and immediately after extraction which typically presents as blood filling up the mouth. It can also happen due to infection or trauma to blood vessels. Primary bleed is often controlled by local techniques like pressure packs, haemostatic agents, etc.

Pressure pack is generally a gauze pack that is placed as such or soaked with normal saline that is placed at the extraction site under bite pressure of the patient. Any primary bleed that persists for up to 20 mins following extraction and can be categorized as mild.

AIM OF THE STUDY:

To compare the effectiveness of lidocaine with 1:100000 adrenaline-soaked gauze and normal saline soaked gauze in management of primary post extraction bleeding

OBJECTIVES OF THE STUDY:

To explore the efficiency of lidocaine and adrenaline as a primary post extraction haemostatic agent. To determine the relationship between type of haemostatic agent used and duration of post operative bleeding. To determine the influence of gender on amount of post extraction bleeding.

METHODOLOGY:

Type Of Study: Prospective clinical pilot study

Study Design: Cross sectional study

Study Population: Patients visiting outpatient section of Department of Oral and Maxillofacial Surgery of a tertiary dental care hospital in Kelambakkam for extraction

Sample Size: 20 patients

Type Of Blinding: Single sided (participant)

Inclusion Criteria:

- Age -> 18-45 years
- Indicated for single tooth normal extractions under LA
- Negative COVID history over the past 6 months/ vaccinated with 2 doses

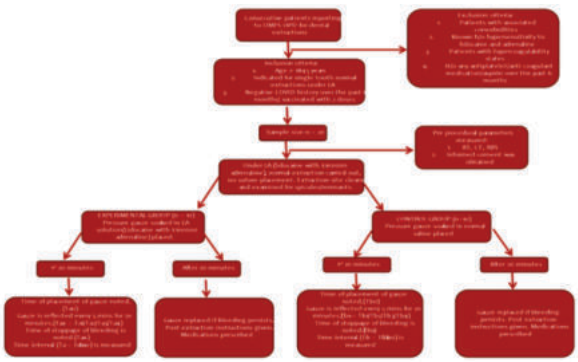
Exclusion Criteria:

- Patients with associated comorbidities, medically unfit for dental extractions
- Patients with absolute and relative contraindications for dental extraction
- Known h/o hypersensitivity to lidocaine and adrenaline
- Patients with hypercoagulability states
- H/o any antiplatelet/anti-coagulant medication/aspirin over the past 6 months

Study Procedure:

Patients that are candidates for dental extraction are chosen for this study who match the inclusion criteria. Under Local anaesthesia, dental extraction carried out as per protocol of the department. Patients were divided into two groups, Group E and C and the selection was single blinded. The extractions were carried out by a single operator. Extraction site cleaned and examined for spicules/remnants. In the EXPERIMENTAL GROUP (n = 50) Pressure gauze soaked in LA solution (Lidocaine with 1:100000 adrenaline) placed in the extraction socket immediately post extraction for haemostatic control and in the CONTROL GROUP (n=50) Pressure gauze soaked in normal saline placed over the extraction socket. For both groups, time of placement of gauze noted. (Ta0) Gauze is reflected and status of haemostasis is checked every 5 mins for 20 minutes. (Tax = Ta1/Ta2/Ta3/Ta4) Time of stoppage of bleeding i.e., achievement of haemostasis is noted. (Tax)Time interval (Ta = Tax-Ta0) is measured and readings were tabulated and a statistical analysis was done to check for significance.

Table 1. Workflow



Statistical Analysis:

Descriptive statistics were used to report means and standard deviations. **Independent sample t test** was used to determine the statistical differences in the means of the two study groups. Analyses were performed in the **IBM SPSS Statistics 28.0.0.0.** Total number of participants recruited for study is 100, of which 50 were male and 50 were female.

Time Interval Taken For Hemostasis:

Table 2

Type_of_soaked_gauze	Mean	N	Std. Deviation
Lidocaine with 1:100000 adrenaline	0:09:30	50	0:03:41
Normal Saline	0:08:00	50	0:03:29
Total	0:08:45	100	0:03:34

Independent Sample T-test:

Table 3

		Levene's Test for Equality of Variances	
		F	Sig.
Time interval taken for stoppage of bleeding	Equal variances assumed	.116	.737
	Equal variances not assumed		

T- Test For Equality Of Means

Table 4

	t-test for Equality of Means							
	t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper
Equal variances assumed	.933	18	.182	.363	0:01:30	0:01:36	-0:01:52	0:04:52
Equal variances not assumed	.933	17.948	.182	.363	0:01:30	0:01:36	-0:01:52	0:04:52

RESULTS:

Total number of participants recruited for study is 100, of which 50 were male and 50 were female. In the experimental group, 26 females (60%) and 24 males (40%) were present; whereas in control group, 24 females (40%) and 26 males were present (60%). P-value obtained (0.363)>0.05 -> statistically not significant. 95% confidence interval = -01:52 - +04:52 -> statistically not significant. Therefore, we can conclude that there is no statistical difference between the meantime interval for management of primary post extraction of the two groups.

CONCLUSION:

From this study we can conclude that local anaesthesia with adrenaline or a saline soaked gauze doesn't have significant difference in efficacy of achieving haemostasis in post extraction sockets. There are be many other proven methods available for this purpose of haemostasis after dental extraction. However only if an uncontrolled bleed that didn't achieve primary haemostasis requires such intervention, locally or systemically depending on the cause and bleeder source.

DISCUSSION:

All local anaesthetics possess a degree of Vaso activity, mostly causing vasodilation, whereas some may cause vasoconstriction. Cocaine is the only local anaesthetic drug that produces vasoconstriction at commonly employed dosages. All other local anaesthetics produce a peripheral vasodilation thereby increasing the rate of absorption of the local anaesthetic into the blood, decreasing the duration and quality of pain control, increasing the plasma concentration, bleeding and its potential for overdose. Lignocaine is a commonly used local anaesthetic agent, however plain lignocaine due to its vasodilating properties limit the duration and the depth of pulpal anaesthesia, increasing the risk of adverse reactions (1). Jern- beck and Samuelson reported that lidocaine regulates vascular tension in a diphasic manner, i.e., lidocaine causes vasoconstriction at lower concentrations and vasorelaxation at higher concentrations (2). Wad- strom and Gerdin also demonstrated that lidocaine induced vasoconstriction at concentrations relevant to use as a local anaesthetic, although it counteracted Vaso- spasm provoked by a mechanical pinch (3). Gray te .la demonstrated that surgical anaesthesia was achieved more than twice as frequently with a local anaesthetic solution containing vasoconstrictor as one without (4). The addition of adrenaline to the local anaesthetic solution increased the duration of anaesthesia, fourfold as opposed to plain lignocaine. The adrenaline acted on the adrenergic receptors in the smooth muscle wall of the arterioles, to reduce blood flow thereby delaying the clearance of the adrenaline and increasing the duration of anaesthesia (5)

Following extraction of a tooth, irrigation with normal saline tends to wash away fresh blood, decrease socket bleeding and remove debris from the socket blood, this may also increase the risk of AO incidence, especially in older patients. (6) Irrigation using warm saline as opposed to cool or room temperature saline has been associated with reduced bleeding. (7) A recent study in oral surgery comparing dressings soaked in room temperature saline to saline dressings warmed to 42°C reported reduced bleeding with the warmed saline dressings. Another study had proved the efficacy of warm saline for haemostasis in endoscopic sinus surgery and treatment of epistaxis [8-10]. A randomized, control trial during total knee arthroplasty that compared irrigating with cold (4°C) saline with 0.5% epinephrine versus normal saline (no epinephrine) at normal temperature (21-24°C) reported that patients irrigated with cold saline experienced significantly less drainage post-operatively and a significant less decrease in haemoglobin [11].In a study involving patients undergoing external rhinoplasty ,patients were given cold (2-8°C) saline-soaked gauze to the nasal dorsum during the procedure and had significantly less operative bleeding than the group with dry gauze compression [12].

The initiation of haemostasis in extraction socket begins with injury to the endothelium and tissue factor release, ultimately leading to thrombin formation. Platelet aggregation and activation occur during the amplification phase (14), and provide the initial haemostatic response (13). Finally, fibrin formation and stabilisation of the platelet clot occur during the propagation phase (14). This is similar to healing in a post extraction socket.

Nagraj et al (15) classified Post.extraction bleeding as primary prolonged bleeding and secondary prolonged bleeding. Primary prolonged bleeding occurs during the exodontia procedure, and may be due to traumatic extraction leading to laceration of blood vessels, infections such as periapical granuloma, or injury to the bone which then in turn cause the bleeding hence Primary bleeding occurs usually

72 hours after the surgery whereas secondary bleeding occurs after 7-10 days.

Clinical decision making on how to control PEB depends on multiple factors, such surgical location and site of bleeding, wound size, extent of bleeding, accessibility of the bleeding site, and timing of bleeding (16).

Nagraj (15) et al classified the measures of controlling PEB as local and systemic interventions. Local interventions can be further subdivided into surgical interventions, non-surgical interventions and a combination of both. For surgical management mainly primary closure the extraction or bleeding site was done (17). Non.surgical haemostatic measures, or styptics, encompass an array of pharmacotherapies, sealants, adhesives, absorbable agents, biologics, and combination products. Other common haemostatic agents included local pressure application with gauze, oxidized cellulose, gel foam, thrombin, collagen fleeces, cyanoacrylate glue, acrylic or surgical splints, local antifibrinolytic solutions, such as tranexamic acid mouthwash, fibrin glue or adhesive, resorbable gelatin sponge, collagen sponge, gauze soaked with tranexamic acid, chlorhexidine bio-adhesive gel, calcium alginate, Haem coagulase, green tea extract, Chitosan-based dressings, and bone wax. (15) Various combinations of surgical and non.surgical interventions have also been used, such as tranexamic acid mouthwash along with gelatin sponge and sutures, and fibrin glue with collagen fleece and sutures (18).

Systemic interventions are especially important in patients who have an associated systemic cause for bleeding as local haemostatics results in only temporary cessation of bleeding (18). Systemic interventions include administration of fresh frozen plasma (FFP), platelets, or both (19), factor replacement therapy, using recombinant or plasma-derived anti- haemophilic factor A (FVIII) or anti-haemophilic factor B or Christmas factor (FIX) in the case of haemophilia, and plasma- derived Von Willebrand factor (VWF)/FVIII concentrates in the case of Von Willebrand disease , intranasal desmopressin , intravenous synthetic vasopressin , oral or intravenous tranexamic acid , oral or intravenous epsilon amino-d-caproic acid . (15)

Haemostatic agents act to stop bleeding by causing vasoconstriction or promoting platelet aggregation, whereas tissue adhesives or sealants bind to and close defects in tissue (20). Systemic interventions work by inhibiting fibrinolysis or promoting coagulation (21).

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