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Plastic Surgery Related Problems in a Designated COVID Hospital - A Retrospective Study

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Abstract

COVID-19 has had immense effect on the resource of the country with large number of admissions in the critical care unit and in the ward. The paper gives an insight to the plastic surgery related problems encountered in a designated COVID-19 institute, like pressure sore, facial fracture and accidental scald burn. We assessed the spectrum of referrals that were seen and have drawn a relation to the drugs administered, falls in the ward, scald burn due to steam inhalation and the correlation between the number of patients who were intubated or required any assistance in respiration due to the COVID-19 pneumonia.

Keywords: COVID -19; Pressure sore; Accidental scald burn; Facial fracture

Introduction

Beyond the severe respiratory distress now associated with severe Coronavirus Disease-19 (COVID-19), the virus also may increase patients' risk of heart attack, kidney failure and clotting disorders [1]. Thus a patient affected with COVID-19 presents with varied complications due to the number of body systems being affected.

A healthcare worker working with COVID patients is given personal protection equipment consisting of a disposable gown, N95 mask, Face shield and gloves. The PPE components like two layers of gloves can hamper with the dexterity and feel of the wound or skin turgor [2], or any activity requiring tactile input, the face shields and goggles can hamper visual acuity causing fatigue after long shift hours, and gown can cause heat exhaustion decreasing the efficiency of the staff as well as the doctors.

Recognizing the staff in PPE becomes difficult for the patient to ask for help and also hearing and communication becomes difficult for the staff with the patient [2]. Older population of patients tends to be independent [3] and thus may lead to accidents in the ward requiring attention and the general belief among the population about steam inhalation aiding in COVID-19 and steam inhalation will reduce the infection may also lead to certain events in ward that requires attention [4].

The study focuses on the spectrum of plastic surgery problems which arose in patients admitted primarily for COVID-19, like pressure sore, facial fracture, lacerated wounds, and accidental scald burn.

Materials and Method

A retrospective study to quantify and gauge the spectrum of complications encountered in patients infected with COVID-19 in our hospital from April 2020 to December 2020. Details of the patient referred to us for above mentioned plastic surgery problems were obtained from database. Informed consent was taken as per the guidelines of the ethical committee of our hospital. Data assessed includes: Demographic, referrals for the complications and its detail, those patient who require ventilator support, patients receiving heparin/enoxaparin and Remdesivir. Inclusion criteria: All plastic surgery related problems due to treatment and nursing care. Exclusion criteria: Pre-existing plastic surgery problems are excluded.

Results

During the study 42 cases were seen with various complications like pressure sore, facial fracture,

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Figure 1: Scapular pressure sore.

Figure 2: Eschar covered pressure sore.

Figure 3: Nasal pressure sore.

Figure 4: Accidental scald burn.

lacerated wound and accidental scald burn from which 42.85% were females 57.14% were males (Graph 1).

From the 42 cases assessed by our department 80.95% were for pressure sore, 9.5% for accidental scald burn, 7.14% facial fracture and 2.3% for lacerated wound, latter two due to fall [5]. Pressure sore were referred to us after average of 11.92 days after admission [6]. In a study by Keller et al. [6] and Shahin et al. [7] the majority of pressure ulcers developed in the intensive care unit within a period of less than 2 weeks. Prolonged immobilization in ICU, loss of sensory perception due to medications such as sedatives and maceration of the skin (due to incontinence, sweating), injectable steroids being few of the causes. The workload for ICU nursing staff increases by 50% once a pressure ulcer has developed [8]. Prolonged hospital stay and increased workload in turn are responsible for the major costs that are associated with pressure ulcer treatment (Graph 2).

There was 88.23% (30 out 34) grade II ulcers and 11.76% Eschar covered; 61.76% had ischial pressure sores followed by 5.88% of ischial + sacral, ischial + nose, sacral and nasal pressure sores (due to BIPAP use), trochanter each. 2.94% of scapular pressure sore. In a study by Shahin et al. [7] most common body sites of pressure ulcers were the ischium (54.9%), heel (39.6%) and sacrum (38%).

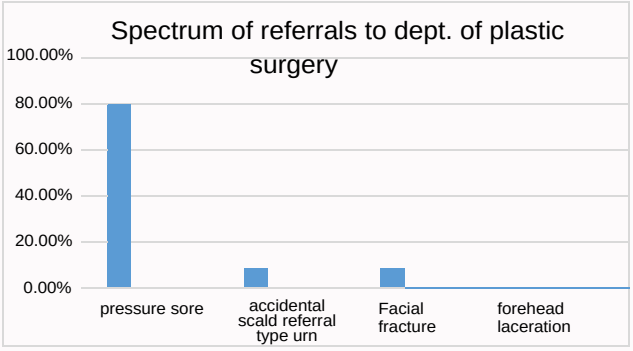
79.4% (27 out of 34) patients were given steroid in some form, were referred for pressure sore 20.58% was not given steroid and developed pressure sore. In study conducted by Chen et al. [9] 43.8% patients developed pressure sore who were given steroid before major stress to the body like surgery and only 14.8% developed pressure ulcer when steroid was omitted (Graph 3).

Number of intubated patients 61.76% (21 out of 34) patients and 17.64% (6 out of 34) were on BIPAP support, the rest of the patients were on oxygen support. 82.35% (28 out of 34) patients received Remdesivir and 71.42% (30 out of 42) patients received higher antibiotics like meropenem, vancomycin, piperacillin-tazobactam. 58.82% of the pressure sore patients (20 out of 34) were on heparin or low molecular heparin. It has been shown that both heparin and low molecular weight heparin has deleterious effect on wound healing due to converting large amount of soluble collagen to insoluble collagen, thus leading to interfering in the cross linking of collagen besides activating the enzyme collagenase [10,11] (Figures 1-3).

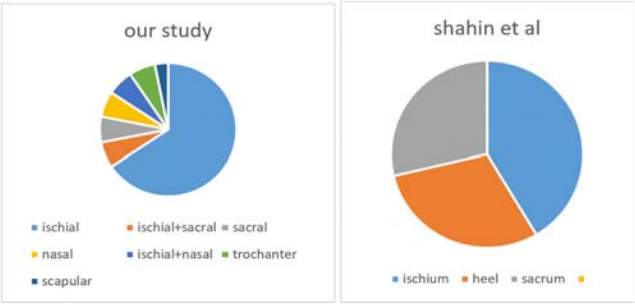
The patient with accidental scald burn was 4 with 1% burn each most common area affected was the thigh 75% and face in 1 patient i.e. 25% all were superficial second degree burn and healed uneventfully with jelonet dressing. In a study by Sarah et al. [12] most common area involved was abdomen in pediatric age group and lower limb in adults (Figure 4).

Out of the three facial fracture patients referred 66.66% (2 out of 3) had orbital fractures and one required operative intervention due to 9 mm infra orbital defect. 66.66% (2 out of 3) had poster lateral left maxillary sinus fracture. 33.33% (1 out of 3) had minimally displaced Zygomatic arch fracture on left side. 33.33% (1 out of 3) had isolated nasal bone fracture. In a study conducted by Liu et al. [13], over 50% of the facial fractures requiring operative treatment involved peri-orbital region. Other common fracture were mandible fractures (31%) and zygoma fractures (18%). One case of isolated forehead laceration with no facial fracture was also noted and patient underwent suturing under local anesthesia for the same. 50% (2 out of 4) of the patients had received Remdesivir who were referred for fall and subsequent facial fracture in one and right eyebrow laceration requiring suturing in other. In a study done by Fan et al. [14] 4 out of 53 patients had experienced hypotension after receiving Remdesivir (Figure 5).

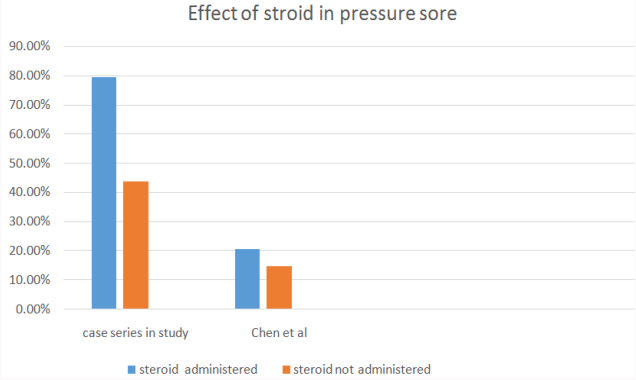
Figure 5: Inferior wall orbit fracture.



Graph 1: Number of referrals to plastic surgery department.



Graph 2: Comparison between our study and study by Shahin et al. [8].



Graph 3: Comparison of effect of steroid on pressure sore between our study and Chen et al. [9].

Conclusions

Arterial oxygen saturation was significantly improved in the sitting and standing position compared to supine, suggesting a beneficial effect of overall verticalization. Therefore this position can be considered interesting for ARDS management as an alternative and simpler approach to prone position [15]. Elevation of the head and trunk of a supine patient to more than 30° and the Trendelenburg position given to improve oxygenation [16] and work of breathing produce a tendency to slide downwards. Both tissues of the sacrococcygeal area and the heels especially undergo shearing forces in this position [17].

An excess or deficiency of cortisol may have harmful effects called allostasis (cacostasis) on cutaneous neuroendocrine system. During inflammatory state which Covid causes in the body can disturb the homeostasis [18]. Excessive cacostasis for steroid would include inhibition of epidermal barrier function, inhibition of wound healing, and immunosuppression, which might lead to infection. Excessive allostatic activities of glucocorticoid in skin increases vulnerability to infection, damage by external physicochemical agents, and a loss of water.

With regard to facial fracture, most people normally attempt to break their fall with the upper extremities; however, elderly patients may experience changes in vestibular and visual changes, as well as impairments in balance, strength, flexibility, cognition, and reflex, decreasing the appropriate response time and actions during a fall [19]. Orthostatic intolerance commonly occurs after prolonged bed rest, thus increasing the risk of syncope leading to falls. Baroreflex-mediated adjustments of heart rate and sympathetic vasomotor activity (Muscle Sympathetic Nerve Activity - MSNA) are crucial for orthostatic tolerance. In this context, reduced gravity tolerance, induced by the gravitational and physical de-conditioning associated with bed rest, was found to promote an increased risk of loss of consciousness and falls [20].

Heated, humidified air has long been used by people with the common cold. The theoretical basis is that steam may help congested mucus drain better and that heat may destroy the cold virus as it does *in vitro* [21], which leads to accidental scald burn due to hot water.

This COVID-19 pandemic has given us an opportunity to analyze the plastic surgery related problems during the treatment of COVID-19.

References

1. Jain U. Effect of COVID-19 on the organs. Cureus. 2020;12(8):e9540.
2. Agarwal A, Agarwal S, Motiani P. Difficulties encountered while using PPE kits and how to overcome them: An Indian perspective. Cureus. 2020;12(11):e11652.
3. Talarska D, Strugała M, Szewczyczak M, Tobis S, Michalak M, Wróblewska I, et al. Is independence of older adults safe considering the risk of falls? BMC Geriatr. 2017;17(1):66.
4. Colin TB, Jia C. Steam inhalation and paediatric burns during the COVID-19 pandemic. 2020.

5. Allman RM, Goode PS, Patrick MM, Burst N, Bartolucci AA. Pressure ulcer risk factors among hospitalized patients with activity limitation. JAMA. 1995;273(11):865-70.
6. Keller BPJA, Wille J, van Ramshorst B, van der Werken C. Pressure ulcers in intensive care patients: A review of risks and prevention. Intensive Care Med. 2002;28(10):1379-88.
7. Shahin ESM, Dassen T, Halfens RJG. Pressure ulcer prevalence in intensive care patients: A cross-sectional study. J Eval Clin Pract. 2008;14(4):563-8.
8. Barratt E. Pressure sores. Putting risk calculators in their place. Nurs Times. 1987;83(7):65-70.
9. Chen HL, Shen WQ, Xu YH, Zhang Q, Wu J. Perioperative corticosteroids administration as a risk factor for pressure ulcers in cardiovascular surgical patients: A retrospective study. Int Wound J. 2015;12(5):581-5.
10. Tarvady S, Anguli VC, Pichappa CV. Effect of heparin on wound healing. J Biosci. 1987;12:33-40.
11. Oken OF, Yildirim AO, Gulcek M, Unal VS, Karakuyu A, Ozlu K, et al. The effect of prophylactic dose of a low molecular weight heparin on skin wound healing of rats. Acta Cir Bras. 2009;24(6):471-5.
12. Al Himdani S, Javed MU, Hughes J, Falconer O, Bidder C, Hemington-Gorse S, et al. Home remedy or hazard? Management and costs of paediatric steam inhalation therapy burn injuries. Br J Gen Pract. 2016;66(644):e193-9.
13. Liu FC, Halsey JN, Oleck NC, Lee ES, Granick MS. Facial fractures as a result of falls in the elderly: Concomitant injuries and management strategies. Craniomaxillofac Trauma Reconstr. 2019;12(1):45-53.
14. Fan Q, Zhang B, Ma J, Zhang S. Safety profile of the antiviral drug remdesivir: An update. Biomed Pharmacother. 2020;130:110532.
15. Richard JCM, Maggiore SM, Mancebo J, Lemaire F, Jonson B, Brochard L. Effects of vertical positioning on gas exchange and lung volumes in acute respiratory distress syndrome. Intensive Care Med. 2006;32(10):1623-6.
16. Mezidi M, Guérin C. Effects of patient positioning on respiratory mechanics in mechanically ventilated ICU patients. Ann Transl Med. 2018;6(19):384.
17. Herman LE, Rothman KF. Prevention, care and treatment of pressure (decubitus) ulcers in intensive care unit patients. J Intensive Care Med. 1989;4(3):117-23.
18. Slominski AT, Zmijewski MA. Glucocorticoids inhibit wound healing: Novel mechanism of action. J Invest Dermatol. 2017;137(5):1012-4.
19. Liu F, Oleck N, Lee E, Granick M, Halsey J. Facial fractures as a result of falls in the elderly: Concomitant injuries and management strategies. Craniomaxillofacial Trauma & Reconstruction. 2018.
20. Barbic F, Heusser K, Minonzio M, Shiffer D, Cairo B, Tank J, et al. Effects of prolonged head-down bed rest on cardiac and vascular baroreceptor modulation and orthostatic tolerance in healthy individuals. Front Physiol. 2019;10:1061.
21. Singh M, Singh M, Jaiswal N, Chauhan A. Heated, humidified air for the common cold. Cochrane Database Syst Rev. 2017;8(8):CD001728.