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WOUND INFECTION IN IMMUNE COMPROMISED PATIENTS WHO WERE OPERATED IN EMERGENCY DEPARTEMENT.

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ABSTRACT

AIM OF STUDY: To determine the wound infection in immune compromised patients who were operated in Emergency department. **STUDY DESIGN:** Prospective observational study. **PLAC E & DURA TION:** Two years' study January 2018 to March 2020 conducted at Liaquat University of Medical and Health Sciences / Jamshoro in department of surgery **PATIENTS & METHOD:** The study comprises 100 patients. All were admitted from Emergency department. All patients were evaluated fully after history & clinical examinations and specific investigations pre operatively ,per operatively and post operatively (CBC) complete blood count , C reactive protein , Blood culture , urine culture, IV cannula Tip culture ,Pus culture and Sensitivity, ultra sound of abdomen, pelvis and Chest , X- ray abdomen supine and erect posture ,X Ray chest PA view ,Urine DR, Protein A/G Ratio, level of serum Albumin, Liver function Test (LFT) Serum ferritin , Lactate Dehydrogenase, Blood urea, sugar, serum electrolyte, HBSAG, HCV, & HIV, PT, APTT, INR and ECG . Typhi dot, Tuberculin test, Biopsy report and general assessment of the patients. Post operatively Contrast iv and Oral C T scan if needed **RESULTS:** This was a hospital based case series study of 100 patients, the maximum number of patients were in age group between 12 to 75 years. Out of 100 patients 33 patients were presented with age group between 12 to 34 year. 45 patients were presented with age group between 35 to 55 years. 22 patients were presented with age group between 54 to 75 years. Out of 100 patients, 62 were operated through mid line incisions, 25 patients were operated through right Para median incision. Out of 100 patients 10 patients were operated through Gird Iron incisions. Out of 100 patients 61 patient present with serious discharge, 25 patients with Pus discharge, 10 patients with abdominal dehiscence 4 patients presented with fecal fistula. Out of 00 patients 55 patients were presented with serum Albumin level 2 gram ,22 patients were presented Serum Albumin level 2.5 gram ,13 patients were presented Serum albumin level 3 gram ,12 patients Were presented serum Albumin level 3.3 gram Out of 100 patients 31 patient were presented hemoglobin 10 to 12 gram .44 patients were presented Hemoglobin 8 to 10 gram. 13 patients were present HBA1c 7 to 8 gram. 12 patients were presented serum creatinine. Level between 2 to 3. CONCLUSION**:** Patients were admitted and operated in emergency department, already immune compromised, depleted, comorbid, anemic and edematous prone to developed wound infection either superficial or deep if not treat as soon as possible patient can die systemic complications.

KEY WORDS: Wound infection, immunocompromised patient, Emergency Treatment.

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INTRODUCTION

Post operatively wound infection is a common problem in our set up in those patients they were admitted and operated at emergency department. they were already immunocompromised pre operatively [1]. Patient present with Acute abdomen previously Suffered intestinal Pathology , Obstruction or ,hollow viscus perforation[2] ,Acute Pancreatitis ,diabetes mellitus , kidney disease, Chronic liver disease, cardiac diseases ,metabolic disease ,auto immune disease blood disorder, patient on chemotherapy ,Radiotherapy ,steroid therapy, Blood Disordered(Anemic) Tuberculosis Of Lungs or Intestine ,HIV Who were Long Standing on Parenteral Nutrition [3,4] , patients need Optimizations Pre operatively and post operatively initial steps of managements are IV cannula NO 16 with crystalloid ,colloid fluids, blood and blood products, VIT k ,fresh frozen plasma ,oxygen ,physiotherapy, early mobilization ,immunotherapy ,albumin and vaccinations And Antibiotics [5,6.] Try to prevent post operative complications , wound infection . suppose to patient is severely prone to developed wound infection either superficial , deep , along with collection in side the abdominal cavity Patient will Febrile .Techy panic , Hypotensive ,Tachycardia and oligo ureic, Assessed clinically along with Base Line investigations such as Complete Blood Count , ESR ,blood urea ,blood sugar, serum electrolyte, liver function test, Pro thrombin time, (PT)Activated partial thrombin time (APTT) , Protein A G ratio , serum Albumin , ABGS ,Blood culture ,Urine culture, urine DR, HBSAG,HCV, HIV Coved 19 and serum amylase[7,8] with imaging ultrasound of abdomen for collection specific organ involvement, x ray abdomen supine or erect posture, necessary for obstruction and .CT Scan of IV and oral Contrast of abdomen and pelvis for confirmation of diagnosis . pre and post-operative MRI, MRA abdomen and pelvis for collection, ECG and Echocardiography[9,10]. Many Types of surgeries such as clean, clean contaminated, contaminated and dirty. Percentage of infection according to type in clean surgery less then infection rate 2 % in clean contaminated is 10 % Contaminated 25 t0 30 % and in Dirty more then 40 % .[11,12] wound infection most commonly seen in those patient who were present in emergency department with Arrived late, referred from peripheries they were managed conservatively by un experienced person, imaging facilities are not available. So they were referred to tertiary care hospital for further management. during receiving time patient is severely dehydrated with systemic parameters are De ranged .some patient severely immunocompromised having comorbidities [13,14] .If patient diagnosed gut perforation at the time of night try to treat it at night before sun rise[12,13] .feculent abdominal collection or pus collection seen at the time of surgery try to send pus culture and sensitivity then wash the abdominal cavity with 10 to 12 liters of

normal saline avoid post operatively septic foci or residual collection then put a drain in pelvic cavity try to close abdomen aseptic measures with or without skin closure ,skin will close later on . Wound will asses with the help of south amp ten grading system, post operatively patient asses clinically or series of abdominal ultra sound for any collection. if patients developed post operatively wound infection. that infection is a bed sign for prognosis of patient[12,13]. Try to avoid systemic complications such as hypothermia, metabolic acidosis, disseminated intravascular coagulation (DIC), systemic inflammatory response syndrome (SIRS), multiple organ dysfunction syndrome (MODS) and multiple organ dysfunction failure (MODF) m after resuscitation patients can not improved & patients will die such types ofcomplications.[14,15,]

Immunocompromised patient will treated with antibiotic cover, Nutritional build up of orally, parenterally, Blood and blood products, Albumin and with Vaccine. [16.17]

PATIENTS & METHODS

It was a Prospective observational study carried out at surgical emergency ward at liaquat university of medical and health sciences Hyderabad /Jamshoro from Jaunry2018 to March 2020. The study comprises 100 patients. All patient was admitted and evaluated fully after history & clinical examinations and specific investigations pre operatively, per operatively and post operatively (CBC) complete blood count, C reactive protein, Blood culture, urine culture, IV cannula Tip culture, Pus culture and Sensitivity, ultra sound of abdomen, pelvis and Chest, X- ray abdomen supine and erect posture, X Ray chest PA view, CT scan of Abdomen MRI, MRA abdomen FAST Ultrasound of abdomen and pelvis. Urine DR, Protein A/G Ratio, level of serum Albumin, Liver function Test (LFT) Serum ferritin, Lactate Dehydrogenase, Blood urea, sugar, serum electrolyte, serum creatinine, HBSAG, HCV, & HIV, PT, APTT, INR and ECG. Typhi dot, Tuberculin test, Biopsy report and general assessment of the patients. Recorded on a Performa designed for the study. Statistical package for social sciences (SPSS) version 10 was used for statistical analysis of the data.

RESULTS

This was a hospital based case series study of 100 patients, the maximum number of patients were in age group between 12 to 75 years. Out of 100 patients 45 patients were presented with age group between 12 to 34 year. 33 patients were presented with age group between 35 to 54 years. 22 patients were presented with age group between 55 to 75 years. (Table 1) Out of 100 patients, 62 were operated through mid line incisions, 26 patients were operated through right Para median incision. Out of 100 patients 12 patients were operated through Gird Iron incisions (Table 11). Out of 100 patient 61 patient present with serious discharge, 25 patients With Pus discharge, 10 patients with abdominal dehiscence 4 patients presented with fecal fistula (Table 111) Out of 00 patients 55 patients were presented with serum Albumin level 2 gram ,22 patients were presented Serum Albumin level 2.5 gram, 13 patients were presented Serum albumin level 3 gram, 12 patients Were presented serum Albumin level 3.3 gram (Table 1V) Out of 100 patients 31 patient were presented hemoglobin 10 to 12 gram. 44 patients were presented Hemoglobin 8 to 10 gram. 13 patients were present HBA1C 7 to 8.12 patients were presented serum creatinine. Level between 2 to 3 mg (Table no 5)

Table 1 AGE DISTRIBUTION n = 100

Age of the Patients	No of Patients	Percentage %
12 to 34 year	45	45 .0%
35 to 54 year	33	33.0%
55to 75 year	22	22 0%

Table 2: TREATMENT OPTIONS n = 100

Operative Procedure	No of Patients	Percentage %
Laparotomy Mid Line Incision	62	62.0%
Right Para median incision	26	26.0%
Gird Iron incision	12	12.0%

Table 3: CLINICAL PRESENTATION n=100

Patients presentation, Ultra sound findings and type of injury	No of Patients	Percentage
Serious discharge	61	61.0%
Pus discharge	25	25.0%
Abdominal Dehiscence	10	10.0%
Fecal discharge	4	4.0%

Table 4: LEVEL OF ALBUMIN WITH MARKER N=100

Albumin	Patients marker	No of Patients	Percentage %
Serum albumin	2 gram	55	55 .0%
Serum albumin	2.5 gram	22	22.0%
Serum bilirubin	3 gram	13	13.0%
Serum bilirubin	3.3 gram	10	10.0%

Table 5: Biochemistry in patient N=100

Biochemistry	Patients marker	No of Patients	Percentage %
Blood Hemoglobin	10 to 12 gram	44	44 .0%
Blood hemoglobin	7 to 9 gram	31	31.0%
Blood HBAIC	7 to 8	13	13.0%
Serum creatinine	2 to 3 mg	12	12.0%

DISCUSSION

Post operatively wound infection is a common problem in our set up in those patients they were admitted and operated at emergency department. They were already immunocompromised pre operatively[1]. Patient present with Acute abdomen previously Suffered intestinal Pathology, Obstruction or , hollow viscus perforation[2], Acute Pancreatitis, diabetes mellitus, kidney disease, Chronic liver disease, cardiac diseases ,metabolic disease auto immune disease blood disorder, patient on chemotherapy ,Radiotherapy , steroid therapy, Blood Disordered (Anemic) Tuberculosis Of Lungs or Intestine, HIV Who were Long Standing on Parenteral Nutrition[3,4], patients need Optimizations Pre operatively and post operatively initial steps of managements are IV cannula NO 16 with crystalloid, colloid fluids, blood and blood products, VIT K, fresh frozen plasma, oxygen, physiotherapy, early mobilization ,immunotherapy, albumin and vaccinations And Antibiotics[5,6]. Try to prevent post operative complications , wound infection suppose to patient is severely prone to developed wound infection either superficial , deep , along with collection in side the abdominal cavity Patient will Febrile . Techy panic, Hypotensive , Tachycardia and oligoureic, Assessed clinically along with Base Line investigations such as Complete Blood Count , ESR, blood urea, blood sugar, serum electrolyte, liver function test, Pro thrombin time, (PT) Activated partial thrombin time (APTT), Protein A G ratio, serum Albumin, ABGS, Blood culture, Urine culture, urine DR, HBSAG, HCV, HIV Coved 19 and serum amylase[7,8] with imaging ultrasound of abdomen for collection specific organ involvement, X-ray abdomen supine or erect posture, necessary for obstruction and CT Scan of IV and oral Contrast of abdomen and pelvis for confirmation of diagnosis . pre

and post-operative MRI, MRA abdomen and pelvis for collection, ECG and Echocardiography[9,10]. Many Types of surgeries such as clean, clean contaminated, contaminated and dirty. Percentage of infection according to type in clean surgery less then infection rate 2 % in clean contaminated is 10 % Contaminated 25 t0 30 % and in Dirty more then 40 % .[11,12] wound infection most commonly seen in those patient who were present in emergency department with Arrived late, referred from peripheries they were managed conservatively by un experienced person, imaging facilities are not available. So they were referred to tertiary care hospital for further management. during receiving time patient is severely dehydrated with systemic parameters are De ranged .some patient severely immunocompromised having comorbidities [13,14] .If patient diagnosed gut perforation at the time of night try to treat it at night before sun rise[12,13] .feculent abdominal collection or pus collection seen at the time of surgery try to send pus culture and sensitivity then wash the abdominal cavity with 10 to 12 liters of normal saline avoid post operatively septic foci or residual collection then put a drain in pelvic cavity try to close abdomen aseptic measures with or without skin closure ,skin will close later on . Wound will asses with the help of south amp ten grading system, post operatively patient asses clinically or series of abdominal ultra sound for any collection. if patients developed post operatively wound infection .that infection is a bed sign for prognosis of patient [12,13]. Try to avoid systemic complications such as hypothermia, .metabolic acidosis, disseminated intravascular coagulation (DIC), systemic inflammatory response syndrome (SIRS), multiple organ dysfunction syndrome (MODS) and multiple organ dysfunction failure (MODF)m after resuscitation patients can not improved & patients will die such types ofcomplications.[14,15,]

.Immunocompromised patient will treated with antibiotic cover, Nutritional build up of orally ,parenterally, Blood and blood products , Albumin and with Vaccine. [16.1] , sangrasi et al [18] in his study surgical site infection seen in male patient with low hemoglobin level Malone et al[19] shows in his study wound infection more in diabetic patients .ismail et al[20] in his study patient who under vent surgical procedure on steroid therapy for more than a month increasr risk of of surgical site infection along with increase mortality . . This was a hospital based case series study of 100 patients, the maximum number of patients were in age group between 12 to 75 years. Out of 100 patients 45 patients were presented with age group between 12 to 34 year. 33 patients were presented with age group between 35 to 54 years. 22 patients were presented with age group between 55 to 75 years. Out of 100 patients, 62 were operated through mid line incisions, 26 patients were operated through right paramedian incision .Out of 100 patients 12 patients were operated through Gird Iron incisions .Out of 100 patient 61 patient present with serious discharge , 25 patients With Pus discharge , 10 patients with abdominal dehiscence 4 patients presented with fecal fistula Out of 00 patients 55 patients were presented with serum Albumin level 2 gram ,22 patients were presented Serum Albumin level 2.5 gram ,13 patients were presented Serum albumin level 3 gram ,12 patients Were presented serum Albumin level 3.3 gram . Out of 100 patients 31 patient were presented hemoglobin 10 to 12 gram .44 patients were presented Hemoglobin 8 to 10 gram. 13 patients were present HBA1c 7 to 8. 12 patients were presented serum creatinine. Level between 2 to 3 mg

CONCLUSION

Wound infection commonly seen in those patients either preoperatively immunocompromised or having co morbid pathologies or post operatively Patient miss managed without routine dressing

proper antibiotics or patient having metabolic problems , and grossly anemic Patients need proper post operative management Antibiotics ,Antiseptic Dressing and serial of Imaging avoid Intra abdominal collection , Aim is that early mobilization Proper optimization avoid Local and systemic complication.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

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REFERENCES

1. Cuschieri A, Giles SR, Moosa AR. Patient undergoing emergency surgical operations In: Essential surgical practice 4th ed. Oxford Butterworths — Heineinann, 2000:393-413.
2. Richard H. Turnage. Abdominal wall, umbilicus, peritoneum, mesenteries omentum and retroperitoneum. In: Sabiston DC, JR eds. Textbook of Surgery. The biological basis of modern surgical practice. 17th ed. Philadelphia: W.B. Saunders Co.; 2004: 1137-97.
3. Sehein M, Wittman DH, Wise L and R.E. Abdominal contamination infection and sepsis. Br J Surg 1997; 84: 270.
4. Gerart M. Doherty: The peritoneal cavity, intra-abdominal abscesses. In: Way Lawrence W Ed. Current surgical diagnosis and treatment 11th ed. USA: Mcgraw Hill education, 2003:517-32.
5. Allegranzi B, Zayed B, Biscoff P, Kubilay NZ, de Jonge S, de Vries F, et al. New WHO recommendations on intraoperative and postoperative measures for surgical site infection prevention; an evidence – based global perspective. Lancet Infect Dis 2016(12); e288-303.https: //doi.org/ 10.1016 /S1473-3099(16)30402-9.
6. Kobayashi M, Mohri Y, Inoue Y, Okita Y, Miki C, Kusunoki M, Continous follow- up of surgical site infections for 30 days after colorectal surgery. World J Surg. 2008;32(6):1142-6 https://doi.org/10.1007/s00268-008-9536-6.
7 Konishi T, Watanabe T, Kishimoto J, Nagawa H, Elective colon and rectal surgery differ in risk favtors for wound infection results of prospective survelliance.Ann Surg. 2006;244(15):758-63.https://doi.org/10.1097/.sla.0000219017.78611.49.
8. Zinder R, Cooley R, Vlad LG,Molnar JA. Vitamin A and wound healing. Nutr Clin Pract Off Pubi Am Soc Parenter Enter Nutr.2005;34(6):839-49.https://doi.org/10.1002/ncp.10420.
9. Amri R, Dinaux AM, Kunitake H, Bordeianou LG, Berger DL. Risk stratification for surgical site inefctions in colon cancer. JAMA Surg.2017;152(7):686-90.https//doi.org/10.1001/jamasurg.2017.0505.
10. Azoulay E, Russell L, Van de Louw A, Metaxa V, Bauer P, Povoa P, et al. Diagnosis of severe respiratory infections in immunocompromised patients. Intensive Care Med. 2020; 46:298-314.

11. Sutton E, Miyagaki H, Bordeianou LG, Berger DL Risk stratification for surgical site infection after elective rectal cancer resection: a multivariate analysis of 8880 patients from the American College of surgeons Natioanl Surgical Quality Improvement Program database. J Surg Res.2017; 207:205-14. https//doi.org/10.1016/j.jss.2016.08.082.
12. Kalil AC, Opal SM. Sepsis in the severely immunocompromised patient. Curr Infect Dis Rep 2015; 17:487.
13. van Walraven C, Musselman R. The Surgical Site Infection Risk Score (SSIRS): a model to predict the risk of surgical site infections. PLoS One. 2013;8(6):e67167. https://doi.org/10.1371/journal.pone.0067167.
14. Gudiol C, Albasanz-Puig A, Cuervo G, Carratala J. Understanding and managing sepsis in patients with cancer in the era of antimicrobial resistance. Front Med .2021;8:636547.
15. Blackham AU, Farrah JP, McCoy TP, et al. Prevention of surgical site infections in high-risk patients with laparotomy incisions using negative-pressure therapy. Am J Surg. 2013;2059(6):647-54. https://doi.org/10.1016/j.amjsurg.2012.06.007.
16. Freifeld AG, Bow EJ, Sepkowitz KA, et al; Infectious Diseases Society of America. Clinical practice guideline for the use of antimicrobial agents in neutropenic patients with cancer: 2010 update by the Infectious Diseases Society of America. Clin Infect Dis 2011; 52: e56-93.
17. Lamme M, Daviaud F, Charpentier J, Marin N, Thy M, Hourmant Y, et al. Time course of septic shock in immunocompromised and non immunocompromised patients. Crit Care Med. 2017; 45:2301-9.
18. Sangrasi AK, Leghari AA, Talpur AK , Qureshi GA Memon JM.Surgical site Infection Rate and Associated risk Factor in Elective General Surgery at a public sector medical university I n Pakistan .int wound J 2008 ; 5: 74 -78. Costa ML, Achten J, Knight R, Bruce J, Dutton SJ, Madan J, et al. Effect of incisional negative pressure wound therapy vs standard wound dressing on deep surgical site infection after surgery for lower limb fractures associated with major trauma: the WHIST randomized clinical trial, JAMA 2020;323(6): 519-26.http//doi.org/10.1001/jama.2022.0059.
19 Ismail H Horst M, Farooq M, paton JH. Rubinfeld JS. Adverse effects of preoperative steroid use on surgical outcomes.AMJ Surg ,2011 ;201(3): 305 -8 discusion 308 -309 http/doi org /amijssurg 2010.09018
20 Malone D, Genuit T, Tracy JK, Gannon C Napolitano LM Surgical site infection Reanalysis of Risk Factor rs. Urg res 2002 :103; 89 -95. Hotchkiss RS, Monneret G, Payen D. Immunosupression in sepsis: a novel understanding of the disorder and a new therapeutic approach. Lancet Infect Dis 2013;260-8.