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Original Article

Ringers lactate versus normal saline among pediatric patients with acute severe diarrhea

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ABSTRACT

Objective: *This study compares Ringer Lactate (RL) and normal saline (NS) effectiveness in treating pediatric acute severe diarrheal dehydration.*

Methods: *The study was conducted in Agha Khan University Hospital, Karachi, Pakistan from 1st March 2022 to 30 February 2023 in one-year duration. Patients were divided into two equal groups (group RL and group NS) by simple randomization. The randomization process was carried out by a person who was not involved in the study to minimize bias and maintain the integrity of the randomization process.*

Results: *Primary and secondary outcomes at the end of six hours shown in table. II. Improvement in clinical status and pH (≥7.35) in RL group was most common 50.0% as compare to the NS group 27.8%, the difference was statistically significant, (p<0.010).*

Conclusion: *Resuscitation with Ringer's lactate (RL) and normal saline (NS) yields comparable resolution of biochemical and improvement in clinical signs in children with acute severe diarrheal dehydration, with NS showing a trend toward lower creatinine, blood urea, and lactate levels, as well as offering advantages of lower cost and greater availability, thus positioning NS as the preferred fluid choice based on considerations of clinical efficacy, cost-effectiveness, and accessibility.*

Keywords: *Acute severe diarrhea, Ringer's Lactate, Normal Saline, Pediatrics, Electrolytes imbalance*

1. INTRODUCTION

Diarrhea is a highly prevalent and deadly disease, especially in developing countries[1]. It's caused by a parasitic, bacterial and viral infections. It is the second leading cause of death among children under the age of five years globally[2]. The primary reason for this high mortality rate is the rapid loss of fluids and electrolytes, leading to dehydration. In case of acute diarrhea, the intestinal epithelial barrier can become compromised[3]. This leads to the loss of water and electrolytes (such as sodium and potassium) from the gut, resulting in fluid imbalance and dehydration[4].

1st step in managing acute severe diarrhea dehydration in children is to assess the severity of dehydration. This assessment includes evaluating clinical signs and symptoms such as the degree of dehydration, heart rate, respiratory rate, capillary refill time, and other relevant clinical parameters[5]. The cornerstone of managing diarrheal dehydration is the administration of ORS. In cases of severe dehydration or when a child is unable to drink ORS due to lethargy, vomiting, or other reasons, intravenous rehydration may be necessary[6]. Intravenous fluids (IVF), usually isotonic solutions like normal saline, are administered to rapidly correct dehydration[7].

Ringer's Lactate is an IV fluid that contains electrolytes (sodium, potassium, calcium) and lactate. It is often used in cases of dehydration and various medical conditions. RL is considered suitable for correcting dehydration because it helps replace lost fluids and electrolytes. Lactate can be converted to bicarbonate in the body, which can help in maintaining acid-base balance[8].

Normal Saline, also known as isotonic saline or NS, is an IV fluid that contains a concentration of sodium chloride (salt) similar to that of normal blood plasma[9]. It is used to treat dehydration, restore electrolyte balance, and dilute or administer medications. NS is commonly used when there is a need to increase circulating volume or when patients have specific electrolyte imbalances[10].

2. METHODOLOGY

The study was conducted in a Agha Khan University Hospital, Karachi, Pakistan from 1st March 2022 to 30 February 2023 in one year duration. Study received approval from the Institute Ethics Committee (IEC) and before enrolling participants into the study, written informed consent was obtained from the parents or caregivers of the participants. Acute diarrhea is defined as having three or more episodes of loose, watery, or semisolid stools within a 24-hour period for seven days or less. The assessment of severe dehydration in children using the WHO (World Health Organization) scale involves evaluating several clinical signs and symptoms. Presence of two of following signs among, lethargy (unconsciousness), sunken eyes, poor drinking and loss of skin turgor (skin may take more than 2 seconds to return to its normal position after pinching) was considered as severe dehydration. Severely malnourished children, diarrhea above 7 days, chronic systemic illness, bloody stool and who received intravenous fluids just 24 hours before enrollment in study.

Patients were divided into two equal groups (group RL and group NS) by simple randomization. The randomization process was carried out by a person who was not involved in the study to minimize bias and maintain the integrity of the randomization process. The study fluids, RL (presumably a study fluid) and NS (presumably another study fluid), were placed in identical-looking bottles. After filling the bottles with the study

fluids, they were packed into sequentially numbered boxes. Each box appears to contain a specific number of bottle-sets, where one bottle-set consists of 10 bottles, each containing 500 mL of the respective study fluid.Before packaging the bottles into boxes, the previous labels were replaced with new labels bearing the study name and box number.Each eligible child enrolled in the study was associated with a specific serial number, and the study fluid was administered from boxes with serial numbers corresponding to the enrolled child.

Hydration status in a child was assessed, likely due to acute diarrhea, at the end of administering 100 mL/kg of intravenous fluid (IVF) therapy. The subsequent management of the child's condition was based on the World Health Organization (WHO) plan for the management of acute diarrhea. This plan likely includes guidelines for treating diarrhea, which can be quite serious, especially in children. Blood samples were taken from the child both before the start of IVF therapy and at the end of six hours. This could be to monitor electrolyte levels, blood counts, or other parameters to assess the child's response to treatment. The amounts of fluids given (input) and the fluids lost (output) were recorded. The duration of the child's hospital stay was noted. The length of stay can provide insights into the severity of the condition and the effectiveness of treatment.

SPSS version 23 was used for data analysis, mean and SD was calculated for numerical data and frequency (percentages) were calculated for categorical data. After applying test of significance p value less than or equal to 0.05 was taken as significant.

3. RESULTS

Overall, 144 patients were included in this study, both genders. All the patients were divided into two equal groups (RL Group & NS Group). The mean age of RL and NS group was 16.52±2.36 months and 15.48±2.12 months, respectively, (p=0.941). There were 37 (51.4%) males in RL group and 47 (65.3%) males in NS group, (p=0.091). The mean weight of RL and NS group was 9.68±79 kg and 10.29±1.95 kg, respectively, (p=0.053). The clinical and biochemical characteristics of both the groups were almost equal and statistically insignificant, (p>0.050). (Table. I).

Primary and secondary outcomes at the end of six hours shown in table. II. Improvement in clinical status and pH (≥7.35) in RL group was most common 36 (50.0%) as compare to the NS group 20 (27.8%), the difference was statistically significant, (p<0.010). Whereas, in secondary outcomes, electrolytes, renal parameters, AKI, time to start oral feeds and length of hospital stay in RL and NS group was almost equal, with statistically insignificant difference, (p>0.050). (Table. II).

Table. I
Demographic and baseline characteristics at the start of the study

Variable	RL Group	NS Group	p-value
Age (month)	16.52±2.36	15.48±2.12	0.941
Gender			
Male	37 (51.4)	47 (65.3)	0.091
Female	35 (48.6)	25 (34.7)	
Weight (kg)	9.68±79	10.29±1.95	0.053
Duration of symptoms (days)	2.12±0.96	2.00±1.06	0.461
loose stools per day	22 (30.6)	23 (31.9)	0.857
Vomiting	26 (36.1)	34 (47.2)	0.176
Drinks poorly or not able to drink	53 (73.6)	50 (69.4)	0.580
Lethargy or unconscious	62 (86.1)	61 (84.7)	0.813
Sunken eyes	62 (86.1)	65 (90.3)	0.438
Skin pinch goes back very slowly	9 (12.5)	10 (13.9)	0.806
Electrolytes			
Serum Sodium (mmol/L)	136.65±2.32	137.21±3.56	0.741
Serum Potassium (mmol/L)	4.25±0.1	4.23±1.06	0.919

Serum Chloride (mmol/L)	104.45±5.42	106.38±5.24	0.297
Hyperchloremia	53 (73.6)	55 (76.4)	0.700
Renal parameter			
AKI	57 (79.2)	61 (84.7)	0.386

Table. II
Primary and secondary outcomes at the end of six hours

Variable	RL Group	NS Group	p-value
Primary outcome			
Improvement in clinical status (disappearance of signs of severe dehydration) and pH (≥7.35)	36 (50.0)	20 (27.8)	0.006
Improvement in clinical status (disappearance of signs of severe dehydration)	66 (91.7)	65 (90.3)	0.771
Secondary outcome			
Electrolytes			
Serum Sodium (mmol/L)	139.05±6.62	140.77±635	0.114
Serum Potassium (mmol/L)	4.03±0.94	3.90±1.03	0.427
Serum Chloride (mmol/L)	112.18±8.91	112.17±9.15	0.993
Hyperchloremia	2 (2.8)	1 (1.4)	0.560
Renal parameter			
AKI	50 (69.4)	46 (63.9)	0.480
Time to start oral feeds (hours)	1.95±0.68	1.97±0.69	0.903
Length of stay hospital (days)	2.25±1.03	2.59±1.04	0.057

4. DISCUSSION

The study found that patients in both groups NS and RL experienced a similar improvement in clinical status. The change in serum electrolytes and blood gas parameters was similar in both groups. This indicates that the alterations in these physiological measures were consistent between the groups. In our study RL group have 139.05±6.62mmol/L sodium after six hours and in NS group it was 140.77±635mmol/L. Similar ratio was found in other electrolytes.

In this study 51.4% children were male in R/L group and in N/S group 65.3% were male. Another study conducted by Habib et al[11] shows male predominance among children with diarrhea in 2014. In that study, 60% of the children with diarrhea were male, while 40% were female. This suggests that there was a higher incidence of diarrhea among boys compared to girls in the study population. Similarly, Zahoor et al[12] observed male dominancy 66.7% and female 33.3% in study group.

Study by Mahajan et al[13] had 22 participants and did not find any significant difference in pH and had a worse baseline mortality risk score. This suggests that study did not show a correlation between pH and baseline mortality risk score. In another study by Kartha et al[14] reported that there was no significant difference regarding electrolyte imbalance and start of feeding time 1 hour in RL and 1.5 hours in NS group.

Cieza et al[15] found that RL was superior to NS in terms of the time it took for patients to resolve their symptoms of cholera.The mean (average) volume of fluid needed for rehydration in the RL group was 6.25 liters with a standard deviation of ±1.39, while in the NS group, it was 6.51 liters with a standard deviation of ±2.47. Juca et al[16] describe that normal saline can replace body fluids easily but worsen the metabolic imbalances, particularly in individuals who may already have electrolyte abnormalities or underlying health issues.

A study was conducted by Rasheed et al[17] in 2020 and reported that in the group treated with Ringer's lactate, the mean serum bicarbonate level was 13.61 ± 2.41 meq/l and group treated with normal saline, the mean serum bicarbonate level was 9.72 ± 2.07 meq/l that indicate a significant difference ($p<0.001$) between groups. Shaikh et al[18] concluded in a study on fluid replacement therapy in acute peritonitis and

reported that ringer's lactate is much better than normal saline.

An Indian study by Naseem et al[19] also reported similar finding, increase in sodium, potassium and chloride was observed in ringer group but correlation with chloride was not significant. There were a total of 70 children who participated in the study, with 35 children in each of the RL and NS groups. In the RL group, the mean change in serum sodium levels from baseline was 1.4 mEq/L, with a standard deviation (SD) of 4.5 mEq/L. In the NS group, the mean change in serum sodium levels from baseline was 2.1 mEq/L, with a standard deviation (SD) of 4.9 mEq/L. Similar findings were reported by Hasman et al[20] on effect of crystalloid solution on acid base balance.

5. CONCLUSION

Resuscitation with Ringer's lactate (RL) and normal saline (NS) yields comparable resolution of biochemical and improvement in clinical signs in children with acute severe diarrheal dehydration, with NS showing a trend toward lower creatinine, blood urea, and lactate levels, as well as offering advantages of lower cost and greater availability, thus positioning NS as the preferred fluid choice based on considerations of clinical efficacy, cost-effectiveness, and accessibility.

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Original Article

Astigmatism after Phacoemulsification while Using Superior versus Temporal Approach

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ABSTRACT

Objective: *is to assess incidence of surgically induced astigmatism followed by phacoemulsification with clear corneal 3.2mm incision while using temporal and superior approach.*

Methods: *Patients were enrolled in two groups, temporal approach with clear corneal incision and superior approach with clear corneal incision was used. Main variables of study were astigmatism (D) after cataract surgery through phacoemulsification. For outcome measure at 1st postoperative day keratometery was performed and after that followed up at 2 weeks and 8 weeks' period. SPSS version 24 was used for data analysis.*

Results: *Overall, 250 patients were included in our study. The Group I included 125 patients had 130 eyes. The Group II included 125 patients had 132 eyes. The average age of Group I and Group II was 56.45±3.92 years and 57.97±3.61 years, respectively. (p=0.275). The sex distribution of both the group was almost equal, (p=0.893). Whereas, the mean astigmatism of Group I was less than Group II, as 0.51±0.22 and 0.85±0.29, respectively, (p<0.001).*

Conclusion: *Clear corneal incision 3.2 mm and temporal approach induces less surgical astigmatism, even it can be used in against the rule astigmatism cases where horizontal meridian is steeper.*

Keywords: *Phacoemulsification, Surgically induced astigmatism, Superior approach, Temporal approach,*
.

1. INTRODUCTION

Cataract surgery underwent numerous advances in interventions since it was described. In ancient couching was performed that was transferred to intracapsular surgical technique for cataract and after that latest phacoemulsification[1]. Primary aim of all types of cataract surgeries is visual rehabilitation with earlier mobilization, but surgical induced astigmatism (SIA) is main obstacle and challenge for ophthalmic surgeons[2]. With passage of time and along different inventions many surgeons strived hard to overcome this hurdle through adopting different surgical approaches[3].

Number of factors like type of surgery, incision type, type of lens and technique of intraocular lens insertion are involved in results of cataract surgery because of their own associated complications and safety measures[4]. Clear corneal incision has benefits of reduced pain and swelling, increased safety and reduced incidence of surgical induced astigmatism, it can also reduce surgical time and fast recovery[5]. Surgically induced astigmatism depends upon size, location, surgeon's position, wound architecture and comfort ability of procedure[6].

Size of incision is also associated with stable and rapid optical recovery and reduced incidence of surgically induced astigmatism[7]. Number of studies was conducted on comparison of different types of incisions like superonasal, superior, temporal and supratemporal and incidence of astigmatism[8,9]. During phacoemulsification at the time of cataract surgery incision at the steepest corneal axis provides small correction of astigmatism. Toric IOLs and peripheral corneal relaxing incision were also effective and safe incision types when preexisting astigmatism is more than 1 diopter[10].

2. METHODOLOGY

This randomized quesi trial was conducted at ophthalmology department of Ghazi medical collage Dera Ghazi Khan from December 2021 to November 2022 in one year period. Study was approved by hospital ethical committee. Written informed consent was obtained from patients after detail description of study and ensuring about confidentiality of their data. Sample size was calculated by using openepi.com online software with 95% confidence interval, 80% study power and mean astigmatism in temporal group 0.48D and in temporal group it was 0.99D in superior clear corneal incision.

All surgeries were performed by a single team of ophthalmic surgeons. Patients with astigmatism above 0.5D, sensitive to study drugs and who are not willing to give consent were excluded from the study. All patients were divided into two groups by lottery method. Patients admitted from outpatients department of hospital day before surgeries. Preoperative assessment of all patients includes measurement of visual aquity, intraocular pressure, fundoscopy, slit lamp examination.

Javel Schiortz Keratometer was used for measurement of IOP. Surgery was performed under peribulbar injection of local anesthesia (Bupicaine 0.5% and Lignocaine 2%). In all patients a clear corneal injection was used. In temporal incision approach position of surgeon sitting was 3 o'clock in left eye and 9 o' clock in right eye. Similarly, in superior approach at 12 o'clock position was used to make main port and 3 o'clock position used for side port in left sided eye.

Patients were advised a combination of topical antibiotics and steroids and follow up at 2 and 8 weeks. At every follow keratometery and auto refraction was done

along with subjective refraction at 8 weeks follow up. SPSS version 24 was used for data analysis. Mean and SD was calculated for numerical data and frequency percentages for categorical data. Test of significance were applied and p values ≤0.05 was taken as significant.

3. RESULTS

Overall, 250 patients were included in our study. The Group I included 125 patients had 130 eyes. The Group II included 125 patients had 132 eyes. The average age of Group I and Group II was 56.45±3.92 years and 57.97±3.61 years, respectively. (p=0.275). The sex distribution of both the group was almost equal, (p=0.893). Whereas, the mean astigmatism of Group I was less than Group II, as 0.51±0.22 and 0.85±0.29, respectively, (p<0.001). (Table. I).

The induced astigmatism distribution at different levels for one or two eyes, for Group I and Group II were shown in table II, (p<0.001). (Table. II).

Table-I: Demographic and clinical characteristics among the groups

Variable	Group		p-value
	Temporal clear corneal incision n=125	Superior clear corneal incision n=125	
Age (years)	56.45±3.92	57.97±3.61	0.275
Sex			
Male	83 (66.4)	84 (67.2)	0.893
Female	42 (33.6)	41 (32.8)	
Astigmatism	0.51±0.22	0.85±0.29	<0.001

Table. II

Induced astigmatism distribution for one or two eye(s) in both the groups

No. of eyes	Group	Induced astigmatism										Total
		0.25 D	0.56 D	0.85 D	0.75 D	0.45 D	0.35 D	0.55 D	1.00 D	1.50 D	1.25 D	
I	TCCI	8	7	13	8	18	10	18	0	0	0	82
	SCCI	0	0	0	30	0	0	0	20	8	35	93
	Total	8	7	13	38	18	10	18	20	8	35	175
2	TCCI	6	4	8	0	-	-	-	0	0	0	18
	SCCI	0	0	0	2	-	-	-	3	4	2	11
	Total	6	4	8	2	0	0	0	3	4	2	29

*Temporal clear corneal incision, *Superior clear corneal incision, p<0.001

4. DICSCUSSION

Primary goal of modern cataract surgery with phacoemulsification is to reduced corneal astigmatism after surgical procedure. Exact evaluation of corneal curvature is requiring as a result of surgery because this may induce different proportions of corneal astigmatism[11]. Giansanti et al[12] conducted a study on 146 patients and compare temporal and superior clear corneal incision, SIA was found lower in temporal corneal incision approach as compared to superior approach. Incision size was 2.75mm in this study.

In our study demographics of patients were almost same. Another study was conducted by Marek et al[13] and compared SIA incidence in 2.8mm temporal and superior incisions. On temporal group mean SIA was 0.63±0.28 D and in superior group it was 1.00±0.54 D, results in both groups were statistically significant p<0.05. Kohnen T et al[14] also give favor to temporal 3.5mm incision approach when compared with other surgical approaches when final results evaluated after six month duration.

In our study mean astigmatism was observed in 0.51±0.22 in temporal incision approach and 0.85±0.29 in superior group. Another study by Moon SC et al[15] reported in his study that 3.2 mm incision through temporal technique can hardly cause astigmatism as compared to superior approach and nor induced any change in preoperative astigmatism. In other Barequet et al[16] compared temporal corneal incision with nasal and concluded that induced astigmatism is 0.74 D in temporal incision and 1.65 D in nasal incision technique.

Similarly Borasio et al[17] compared clear corneal temporal incision with clear corneal on axis incision and after 2 months follow up of phacoemulsification astigmatism was noted 0.34 D in temporal

group and in on axis group it was 0.63 D. Wei et al[18] conducted a study and performed phacoemulsification using 3mm temporal incision and 3mm nasal clear corneal incision and concluded that temporal incision induces less SIA although 6mm foldable IOL was used.

In latest ophthalmic advances cataract surgery and intraocular lens implantation were considered and appreciated as refractive surgery targeting emmetropia postoperatively[19]. Like our observation previous literature also reported that clear corneal temporal incision can cause less incidence of astigmatism. Pakravan et al[20] also compared temporal and nasal clear corneal incisions in cataract surgery with phacoemulsification technique. In post-operative follow up 20% and 35% astigmatism was observed in both groups respectively.

5. CONCLUSION

Clear corneal incision 3.2 mm and temporal approach induces less surgical astigmatism, even it can be used in against the rule astigmatism cases where horizontal meridian is steeper.

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Original Article

Near miss obstetrics events in South Punjab

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ABSTRACT

Objective: *to evaluate the characteristic of near miss obstetrical cases in tertiary care hospital.*

Methods: *Patients were informed about the study's purpose was explained to patients. The study focused on women presenting with life-threatening maternal complications who met the WHO near-miss criteria, which includes clinical, management-based, and laboratory parameters for identification.*

Results: *Regarding complications, sepsis and anemia were the most frequent, affecting 32.1% and 29.2% of patients, respectively. Mean hospital duration was 5.51 days, with the majority of patients (3-5 days) falling within this range. Furthermore, the analysis revealed that both surgical procedure and diagnosis acted as confounders for complications.*

Conclusion: *The near miss concept efficiently uncovers association and similarities among women characteristics who survived pregnancy-related life-threatening complications, with a most of patients reported from rural residential areas.*

Keywords: *Anemia, Hemorrhage, Obstetrical events, Near miss, Sepsis*

1. INTRODUCTION

A "near miss" in pregnancy, also known as a maternal near miss, term used where a woman experiences a severe complication during pregnancy, within 42 days of termination of pregnancy, childbirth, but survives[1]. These complications are often life-threatening and require urgent medical attention and intervention to prevent maternal mortality[2]. Some examples of conditions that may result in a near miss during pregnancy include severe hemorrhage (excessive bleeding), eclampsia (seizures), severe sepsis (infection), ruptured uterus, and severe pre-eclampsia (high blood pressure and organ damage)[3].

Since its inception around 2015, Millennium Development Goal (MDG) number 5 aimed to enhance maternal health and address related issues[4], with progress steadily declining in recent years, currently hovering around 75% below the set target for maternal health and mortality[5].

Severe acute maternal morbidity (SAMM) has been extensively studied as a complement to maternal mortality to assess the quality of obstetrical care in certain institutions[6], with the quality of healthcare information being estimated through the review of maternal near-miss cases and the ratio of maternal deaths; these cases represent potentially life-threatening conditions, with some women narrowly escaping mortality, resulting in either near-miss events or maternal deaths[7].

In under developed countries like India and Pakistan, 75%[8] of women already facing obstetrical complications critically ill upon arrival at tertiary care centers due to delays in seeking healthcare, lack of awareness about warning signs, and insufficient family support. Access to healthcare facilities is further hindered by socioeconomic challenges, exacerbating the situation[9]. Addressing these issues requires comprehensive training for medical staff at rural and peripheral health centers to effectively manage obstetrical emergencies and near-miss cases[10].

The study could serve as a foundation for further research collaborations aimed at exploring the underlying factors contributing to near miss obstetric events in South Punjab, Pakistan. This could lead to the development of more targeted interventions and strategies to improve maternal and neonatal health outcomes in the region.

2. METHODOLOGY

Patients were explained about purpose of study purpose and provided informed written consent. Ethical approval was obtained from the hospital's ethical board. The study focused on women presenting with life-threatening maternal complications who met the WHO near-miss criteria, which includes clinical, management-based, and laboratory parameters for identification. Data collected included the complications, risk factors, number of live births, and associated with maternal near-miss cases.

The clinical criteria for diagnosing severe maternal morbidity include acute cyanosis, respiratory rates exceeding 40 breaths per minute or falling below 6 breaths per minute, oliguria, gasping, clotting factor, stroke, loss of consciousness, pre-eclampsia, jaundice, and fits. Laboratory criteria encompass Bilirubin levels equal to or greater than 6.0mg/dl, <60% oxygen saturation within 60 minutes, thrombocytopenia in acute time with platelet counts at or below 50,000 platelets, and Creatinine levels equal to or exceeding 3.5mg/dl. Management criteria involve addressing acute renal failure, hysterectomy for infections and PPH, administering vasoactive drugs, intubating patients for

ventilation support, and transfusing at least 5 units of packed red blood cells.

Maternal near miss defined as women who have experienced acute obstetric complications posing a threat to their lives but survived due to hospital care or chance, excluding non-pregnant individuals from the study. Obstetrical indices such as the incidence of maternal near miss (number of near miss cases per 1000 live births), were examined alongside factors including gestational age, socioeconomic status of women, at the time of the event, obstetrical complication type, and duration of hospital stay.

Data analysis was conducted using SPSS version 23, with significance defined as p-values less than or equal to 0.05.

3. RESULTS

In this study involving 106 patients, the mean age was 28.17 years with a standard deviation of 4.91. Notably, 74.5% of the patients, amounting to 79 individuals, hailed from rural areas. The most prevalent diagnoses were eclampsia, antepartum hemorrhage (APH), and postpartum hemorrhage, observed in 35.8%, 18.9%, and 14.2% of cases, respectively. Emergency hysterectomy emerged as the predominant surgical intervention, performed in 60.3% of cases. Regarding complications, sepsis and anemia were the most frequent, affecting 32.1% and 29.2% of patients, respectively. The hospital duration was 5.51 days, with the majority of patients (3-5 days) falling within this range.

Table-I: Study characteristics

Characteristics	Frequency (%)
Residence	
Urban	26 (24.5%)
Rural	80 (75.5%)
Diagnosis	
Membrane Rupture	13 (12.2%)
Eclampsia	37 (34.9%)
APH	19 (17.9%)
PPH	16 (15%)
Sepsis	7 (6.6%)
Ectopic	7 (6.6%)
Medical illness	6 (5.6%)
Labor related problem	2 (1.8%)
Type of Surgical	
Hysterectomy in emergency	63 (59.4%)
Laparotomy	12 (11.3%)
Hysterectomy	19 (17.9%)
EUA	6 (5.6%)
SVD	7 (6.6%)
Complication	
Anemia	30 (28.3%)
Sepsis	35 (33%)
CVA	11 (10.3%)
Aspiration	6 (5.6%)
Liver **injury**	9 (8.4%)
Bladder injury	10 (9.4%)
Antennal failure	6 (5.6%)
Hospital stay	
2-3 days	18 (16.9%)
3-5 days	42 (39.6%)
5-7 days	26 (24.5%)
>7 days	20 (18.8%)

Table-II: Associated complications

Effect modifier		Complications							Total	P-value
		Anemia	Sepsis	CVA	Aspiration	Liver damage	Bladder injury	Antennal failure		
Area	Urban	11	7	2	1	2	1	3	27	0.573
	Rural	20	27	8	6	6	8	4	79	
Diagnosis	Rapture membrane	11	0	0	0	0	0	0	11	0.000
	Eclempsia	12	18	8	0	0	0	0	38	
	APH	0	4	2	3	6	5	0	20	
	PPH	2	4	0	2	0	2	5	15	
	Sepsis	3	3	0	0	0	0	0	6	
	Ectopic	1	4	0	1	0	1	1	8	
	Medical problem	0	0	0	1	2	1	1	5	
	Labor related problem	2	1	0	0	0	0	0	0	
Surgical Procedure	Emergency Hysterectomy	16	15	10	5	6	7	5	64	0.003
	Laparotomy	10	1	0	0	0	0	0	11	
	Obstetrical Hysterectomy	4	8	0	2	2	2	2	20	
	EUA	1	4	0	0	0	0	0	5	
	SVD	0	6	0	0	0	0	0	6	
Hospital stay	2-3 days	5	7	2	2	1	0	0	17	0.715
	3-5 days	11	13	5	3	3	5	3	43	
	5-7 days	11	5	1	1	3	3	1	25	
	>7 days	4	9	2	1	1	1	3	21	

4. DISCUSSION

The study was conducted in the South Punjab region of Pakistan, characterized by

limited healthcare facilities and low education rates. Quality of care was assessed by evaluating complications and near miss cases, with the study taking place in a tertiary care hospital with well-managed high-risk wards and ICUs. Typically, less than 10% of near miss cases necessitate admission to intensive care units or high dependence unit, with admission criteria based on recommended guidelines or hospital policy[11].

In this study, sepsis was 34% of patients and anemia in 31% of patients observed as the primary complications associated with maternal near miss (MNM), contrasting with the findings of Naik et al[12], whose study identified hypertensive disorders and hemorrhage as the main complications. However, irrespective of the specific complications, remedial therapy, early identification, and timely treatment remain important factors in improving patient outcomes in potentially life-threatening conditions.

Another study conducted by Jayarathnam et al[13] on a population from a developed country reported that postpartum hemorrhage, sepsis, PPH and pre-eclampsia, are the major complications that lead to maternal near miss. Concordance of this study with shows that the Australian population has three times fewer near miss cases compared to the Pakistani population. Difference may be attributed to factors such as better healthcare facilities, improved awareness about antenatal care, and higher socioeconomic status.

According to a study by Shrestha et al[14] the near miss prevalence cases was found to be 2.3%, with hemorrhage accounting for 41.6%, dystocia for 2.7%, and 19.4% for sepsis of these cases; the study underscores the necessity of implementing an effective audit system to mitigate both near misses and maternal morbidity and mortality, defining near miss cases as those instances where individuals narrowly avoid potentially life-threatening conditions.

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Ali et al[16] conducted a study in Sudan, which revealed that low healthcare facility accessibility and inadequate care levels, compounded by a unawarness in antenatal care and follow up, are the primary issues. Hemorrhage emerged as the predominant complication, accounting for 40.8% of near-miss cases, followed by sepsis or infection at 21.55%. Adisasmita et al[17] study on the Indonesian population echoed these findings, highlighting deficiencies in patient care and healthcare facility availability.

A paradigm shift in maternal health care strategy has been globally observed, with a WHO survey conducted in the 1990s and again in 2011 showing an increase in the presence of skilled health personnel from 58% to 68%[18]. Additionally, a study conducted by Mustafa R et al[19] in 2006 on the Pakistani population reported that among women facing life-threatening conditions, one out of every seven succumbed, with the most common events being hemorrhage (51%), anemia (21.1%), and dystocia (14.8%).

Limitations: The study may only capture near miss events within a specific

time frame, potentially missing fluctuations or trends in near miss obstetrics occurrences over a longer period.

5. CONCLUSION

The near miss concept efficiently uncovers association and similarities among women characteristics who survived pregnancy-related life-threatening complications, with a most of patients reported from rural residential areas, where literacy rate and socioeconomic status play significant roles. Anemia and sepsis emerged as the leading complications of maternal death and near miss events, mirroring observations from previous Pakistani reports, indicating a consistent underlying disease process.

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Original Article

Right ventricle infarction in patients with acute inferior wall infarction

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ABSTRACT

Objective: *to investigate the proportion of right ventricular infarction (RVI) in patients with acute inferior wall myocardial infarction.*

Methods: *A total of 100 patients with acute inferior wall myocardial infarction (MI) were selected for study. RVI was diagnosed through ST segments elevation in V4R or V3R to V6R. In these leads ST segment incidence was assessed and correlated with clinical findings.*

Results: *Acute inferior wall MI and ECG were performed, 66% patients showed elevated ST segments in lead V4R while 42% showed elevated ST segments in leads V3R to V6R. The difference was statistically insignificant. Overall complications were in 62% patients. The most common complications were ventricular fibrillation, conduction blocks and C-shock i.e. 28%, 16% and 11%, respectively.*

Conclusion: *Right ventricle infarction in inferior wall MI patients is common that can be diagnosed by ST elevation in precordial leads V3R, V4R to V6R. Mortality rate with right ventricle infarction is higher as compare to inferior wall MI alone.*

Keywords: *Right Ventricular Infarction, Myocardial Infarction, Acute Inferior Wall Myocardial Infarction, St-segment.*

1. INTRODUCTION

Segmental disease of myocardium named as myocardial infarction occurred mostly due to occlusion of coronary arteries or its branches[1]. It happens due to any adverse event that impairs contractility of a specific part of heart[2]. If coronary artery obstructed for 20 minutes damage will be irreversible, moreover areas are at risk when it prolongs 4-6 hours[3]. First 2-3 hours considered to be golden time because most of damage occurs in this time. Existing collateral flow is responsible for necrosis of cardiac tissue; behind this major cause are coronary artery disease and atherosclerosis[4].

Both these causes contribute to increase tendency for plaque rupture, arterial stenosis and at the end clot development. From the beginning myocardial infarction considered as disease of left ventricle and right ventricle disease labeled as low cardiac index (2.5Llm/m2)[5]. Decrease LV pressure and RV pressure elevation also fall under this category. Right ventricle infarction clinically characterized as clear lungs and arterial hypotension and raised jugular venous pressure[6]. Before RV branch proximal RCA usually caused this damage.

Due to early detection of inferior wall MI is increasing day by day[7]. Different contributing factors are important in hemodynamic grading of RVI like functional status of tricuspid valve, magnitude right ventricle infarction and electrical conduction to ventricles[8]. Another significant contributor is neurohumerol signaling. On ECG three major leads V4R, V3R and V6R signify the RVI by showing ST segment elevation[9]. ECG is an importan, less expensive diagnostic tool for RVI[10]. Aim of our study is to determine role of ST segment elevation in precordial leads in patients of RVI suspected clinically.

2. METHODOLOGY

Study was started after permission from hospital ethical committee and informed written consent from patients. Study was conducted at choidhary Pervaiz Elahi institute of cardiology Multan from April 2019 to April 2020 in one year duration. None probably consecutive sampling technique was used for sampling. Patients presented at emergency department of hospital with acute inferior wall myocardial infarction were included in the study.

All patoents were diagnosed with electrocardiography and evidences of right ventricular infarction after inferior wall infarction saved. Twelve lead ECG was performed for all patients including precordial leads of right side (V1R to V6R). Right sternal border was pointed for V1R and left sternal border was pointed for V2R. V4R was placed at right mid clavicular line. Mid way between V2R and V4R was used for placement of V5R in mid axillary line at right side. ST elevation of more than 0.1 mV or presence of Q wave in all or one of V3R to V6R was labelled as presence of RVI. Electrocardiographic findings of and clinical features were correlated. Jugular venous pressure was monitored by placing patient at 45° position and visible pulsation of internal jugular vein was noted when above the level of clavicle.

SPSS version 23 was used for bio statistical analysis of study data. Mean and SD was calculated and presented for numerical variables and frequency and percentages were calculated and presented for catagorical data. Test of significance were applied to see association among variables. P value less than or equal to 0.05 was taken as significant.

3. RESULTS

A total number of hundred patients were included in this study, both genders. The mean age of the patients was 48.52±5.53 years. There were n=57 (57%) males and n=43 (43%) females, out of 100 patients. Acute inferior wall MI and ECG were performed,n=66 (66%) patients showed elevated ST segments in lead V4R while n=42 (42%) showed elevated ST segments in leads V3R to V6R. The difference was statistically insignificant, (p=0.758). (Table. I). Raised JVP and normal JVP were noted in n=59 (59%) and n=34 (34%) patients, respectively. Association between JVP and blood pressure were shown in table II. The difference was statistically significant, (p=0.001). (Table. II).

Complications with respect to acute inferior wall myocardial infarction were shown in table. III. Overall complications in n=62 (62%) patients. The most common complications were ventricular fibrillation, conduction blocks and C-shock i.e. n= 28 (28%), n=16 (16%) and n=11 (11%), respectively. (Table. III).

The analysis included data from 145 patients, with 53.8% being male and 46.2% female. The mean age of the patients was 54.27 years, with a mean body mass index of 28.63 kg/m^2. The average duration of diabetes was 9.43 years, while hypertension lasted for an average of 8.19 years, and smoking history was measured at 7.87 pack years. Total cholesterol averaged at 202.03 mg/dL, triglycerides at 188.85 mg/dL, and high-density lipids at 38.82 mg/dL. Graph-1 depicted dyslipidemia presence in 80.7% of patients, with 57.2% showing increased cholesterol levels and 70.3% having elevated triglycerides. Additionally, 80% of patients exhibited low high-density lipids, as indicated in Table-2.

Table. I
Incidence of electrocardiographic among the patients

ST-Segment Elevation In leads V3R to V6R	Segment Elevation In leads V4R		Total	P-value
	Yes	Yes		
Yes	27	15	**42**	0.758
No	39	19	**58**	
Total	**66**	**34**	**100**	

Table. II
JVP with respect to hypertension

Findings	Hypertension without shock	Hypertension and shock	Normal Blood pressure	Total
Raised JVP	34	13	12	**59**
Normal JVP	21	10	3	**34**

Table. III
Complications of acute inferior wall myocardial infraction

Complication	Frequency	Percentage
C-Shock	11	11.0
Conduction Blocks	16	16.0
Ventricular Fibrillation	28	28.0
Tachyarrhythmia's	4	4.0
TR	3	3.0
Total	**62**	**62.0**

4. DISCUSSION

Normally ECG not shows perticular changes to diagnose right ventricular infarction, but ST elevation in lead V may be a marker of RVI[11]. In recent days this diagnostic criteria is not valid due to adverse diagnostic modalities. In a study conducted by Haji et al[12] concluded that patient with elevated ST segment and inferior wall MI are at greater risk of having involvement of right ventricle. His findings were statisticaly significant (p=0.001).

In a study conducted by Memon et al[13] reported that ST elevation in V4R was found in 48.5% of patients and in lead V3R and V6R it was observed in 40.5% of patients who were who were admitted for further management. Another similar study was conducted by Kosuge M et al[14] on this topic and reported that diagnosis of RVI on ECG is

easiest, accurate and simple. Its accuracy was reported about 50%.

In a study clear correlation was found between ST elevation of right precordial leads and MI of inferior wall. In a study conducted by Croft et al[15] reported that evidence of electrocardiography showing RVI have 91% specificity and 90% sensitivity to diagnose right ventricular infarction. Another study was conducted by Rashduni et al[16] in 2003 and reported that RVI incidence diagnosed by ST elevation in V4R was 54% specificity, sensitivity 88% and diagnostic accuracy was found 87%.

Another study was conducted by Khan S et al[17] and reported that right ventricular infarction was found in almost one third of patients with inferior wall MI. Infarction of right ventricle is also associated with significant morbidity and mortality and its patients considered high risk patients. Chhapra et al[18] conducted a similar study and reported that in hospital mortality is higher in patients of right ventricular infarction as compare to those patients who were without RVI.

Ali L et al[19] conducted a study in 2013 and reported that patients of right ventricle infarction after inferior wall MI are at greater risk of mortality and long time hospital stay. In comparison patients with only inferior wall MI have less complication rate. Echocardiography was found diagnostic in only 33.33% of patients. Another study by Klein et al[20] reported ST elevation of more than 0.5mV is evidence of infarction of right ventricle because many other factors are also associated with ST elevation.

5. CONCLUSION

6. Right ventricle infarction in inferior wall MI patients is common that can be diagnosed by ST elevation in precordial leads V3R, V4R to V6R. Mortality rate with right ventricle infarction is higher as compare to inferior wall MI alone.

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Original Article

Interlock nailing versus dynamic compression plating in transverse Fractures of tibia

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ABSTRACT

Objective: *to determine the outcome and comparing the two different modalities of the treatment dynamic compression plating and interlocking nail.*

Methods: *Study includes seventy consecutive patients with closed transverse fracture tibia. Patients were divided into two groups (DCP and interlock). Group DCP treated with Dynamic compression platting and interlock with interlock nailing and were assessed clinically and radiologically. SPSS version 23 was used for data analysis.*

Results: *majority of the patients in interlock group was excellent i.e. 54.3%. While, in DCP group the excellent criteria were 22.9%. The difference was statistically significant, (p=0.026). Pearson correlation was also significant, (p=0.003).*

Conclusion: *Interlocking nails is a better treatment option in patients of transverse tibial fractures as compare to interlocking nailing group regarding excellent, good and poor results on basis of weight bearing, time of union and hospital stay.*

Keywords: *DCP, Diaphysial fracture, Fracture, Interlock nail, Implants, Tibia.*

1. INTRODUCTION

High speed traffic accidens are common in this era of industrialization and transportation that can cause multiple traumas to human body[1]. The most common place of injury die to traffic accidents is tibial shaft fracture that affects the young adults[2]. Due to topography, frequengy, type of treatment and mode of injury may cause permanent disability to that person. Beyond the latest inventions and interventiostibilal fracture is still a challenge for orthopedic surgeons due infection and malunion. After the intervention of interlocking nails tibial fracture is no more an enigma[3,4].

All treatment modalities of tibial fracture depend upon the blood supply to bone[5]. Three main blood supply involved in long bone circulation; the nutrients, the epiphyseal and periosteal which are interrelated very closely[6]. Good and excellent functional outcomes can be obtained by managing the fracture with intramedullary or extramedulary nailing. Intramedullary nailing is more favorable when fracture is transverse[7]. Another treatment method is compression plating with active exercises. This technique gives more satisfaction and early recovery to physical activities[8,9]. But skin necrosis and surgical site infection are common complications of this modality that needs to be overcome.

Few decades before plating technique were used to fix the long bone fragments and to align approximations[10]. Mechanical failure of screws and metal plates were also observed. This study was conducted to compare the outcomes of intramedullary nailing and dynamic compression plating in management of transverse tibial fractures.

2. METHODOLOGY

Study was conducted at orthopedic surgery department of Nishter Hospital Multan from January 2019 to January 2020 in one year duration. Study was started after ethical approval from hospital ethical board and detailed information to patient. Non probability consecutive sampling was the sampling technique. Patients of closed tibialtransverse fracture were selected for study. Patients were divided into two groups (group DCP and interlock). Patients in group DCP were treated with dynamic compression plating and interlock nailing technique was used for group interlock patients.

Treatment started with prophylactic antibiotics, splintage, anti-inflammatory medicine, analgesic drugs and intravenous fluids. In DCP group open sedation and internal fixation was done after exposure of fracture site. For transverse fracture 8-10 hole DCP was used. Skin closure and aseptic dressing was applied. Some non weight bearing excerciseswere also advised from 2nd to 3rd day of operation. Interlocking nails technique was in group interlock. In this technique a 5 cm incision was given from medial border of peteller tendon and entry port was secured. Medulary canal was approached by inserting an awl into the metaphysis. Position of awl entry was confirmed on fluoroscopy from all views. Duration of awl was adjusted perpendicular to shaft at the time of penetration in cortex. If reaming technique was used canal should be reamed in 0.5 mm increment instrument. Diameter of nail should be 1.5mm smaller than the last reamer. Patients were radiologically and clinically assessed at 4 week interval regularly and function recovery and union was assessed.

SPSS version 23 was used for analysis of variables, mean and SD was calculated and presented for numerical variables like age and frequency and percentages were calculated and presented for catagirical data like gender and union. Test of significant were applied to see association among varuabkes. P value less

than and equal to 0.05 was used as significant value.

3. RESULTS

Seventy patients were included in this study. The patients were randomized into two groups as DCP(Dynamic compression plating) and Interlock groups, thirty-five patients in each. The mean partial weight bearing time of DCP and interlock groups was 12.62±3.48 weeks and 4.51±2.81 weeks, respectively. The difference was statistically significant, (p=0.000). The mean full weight bearing time of DCP and interlock groups was 17.57±3.79 weeks and 10.02±2.46 weeks, respectively. The difference was statistically significant, (p=0.000). The mean time of union of group DCP and group interlock was 15.31±3.11 weeks and 13.37±2.31 weeks, respectively. The difference was statistically significant, (p=0.004). The mean hospital stay after surgery of DCP and interlock groups was 9.45±3.86 days and 5.95±1.79 days, respectively. The difference was statistically significant, (p=0.000). (Table. I).

Results as per criteria of DCP and interlock groups were shown in table. II. It was seen that majority of the patients in interlock group was excellent i.e. n=19 (54.3%). While, in DCP group the excellent criteria was n=8 (22.9%). The difference was statistically significant, (p=0.026). Pearson correlation was also significant, (p=0.003). (Table. II).

Table. I.
The mean partial weight bearing, full weight bearing, time of union and hospital stay of both the groups

Variable	DCP* n=35 (50%)	Interlock n=35 (50%)	P-value
Partial Weight Bearing (weeks)	12.62±3.48	4.51±2.81	0.000
Full Weight Bearing (weeks)	17.57±3.79	10.02±2.46	0.000
Time of union (weeks)	15.31±3.11	13.37±2.31	0.004
Hospital stay after surgery (days)	9.45±3.86	5.95±1.79	0.000
*Dynamic compression plating			

Table. II.
Results as per criteria of both the groups

Result	DCP n=35 (50%)	Interlock n=35 (50%)	P-value
Excellent	n=8 (22.9%)	n=19 (54.3%)	0.026
Good	n=18 (51.4%)	n=13 (37.1%)	
Fair	n=6 (17.1%)	n=3 (8.6%)	
Poor	n=3 (8.6%)	n=0 (0%)	
Pearson correlation=-0.353, (p=0.003)			

4. DISCUSSION

Management of transverse fracture of tibia with minimal complications and malunion is a challenge for orthopedic surgeons. Different studies recommended different treatments as a best modality. In a study conducted by Wiss et al[11] in in 1986 and recommended open reduction and internal fixation technique for its management and reported advantages of medullary nailing method of treatment. A main advantage of this method is avoidance from pin tract infection.

Another study was conducted by Finkemeier et al[12] on transverse, communated fractures of tibial shaft and reported that medullary nailing brought revolution in field of orthopedic surgery specially for open and closed tibial shaft fractures. Furthermore development of interlocking nailing more sophisticates the specialty. Im et al[13] conducted a similar study and used 10mm, 9mm and 8mm diameter nails and reported that open reduction and internal fixation with dynamic compression plating is better way of tranverse tibial fracture management.

Bedi et al[14] conducted a study on comparison of DCP and interlocking nailing and observed that in interlocking nail group patients starts weight bearing after 6 weeks and in DCP group patientsstarts partial weight bearing after 12 weeks. No patients allowed to full weight bearing before 12

weeks until callus formation at fracrure site. In 2008 Huang p et al[15] reported that communated fractures can e managed better with interlock nailing technique but for uncommunated fractures DCP is better.

In our study male were more in ratio as compare to female because of more outdoor activities and social preponderance. Similar findings were found in a study by Court Brow et al[16] that male patients with young age were more frequent. A study was conducted by Tyo li et al[17] and reported that there was no difference regarding time of union in both groups average time of union in both groups was 12 to 24 weeks.

Kwok CS et al[18] compared malalignment, wound infection, bone union and deep infection and reported that management of transverse tibial fractures with plate as compare to interlock nailng is associated with fewer complications. Another randomizedcontrol trial was conducted on this topic by Vallier et al[19] and reported that high ratio of good results was obtained after both DCP and intermedullary nailng technique, both are equally effective.

Sahni G et al[20] also conducted a study on tibial shaft fracture and concluded that DCP is better mode of treatment with more excellent results in comparison with dynamic compression plating. In this study 90% patients have excellent results and zero percent patients have poor results. While in interlock group 10% patients have excellent results.

5. CONCLUSION

Interlocking nails is a better treatment option in patients of transverse tibial fractures as compare to interlocking nailing group regarding excellent, good and poor results on basis of weight bearing, time of union and hospital stay.

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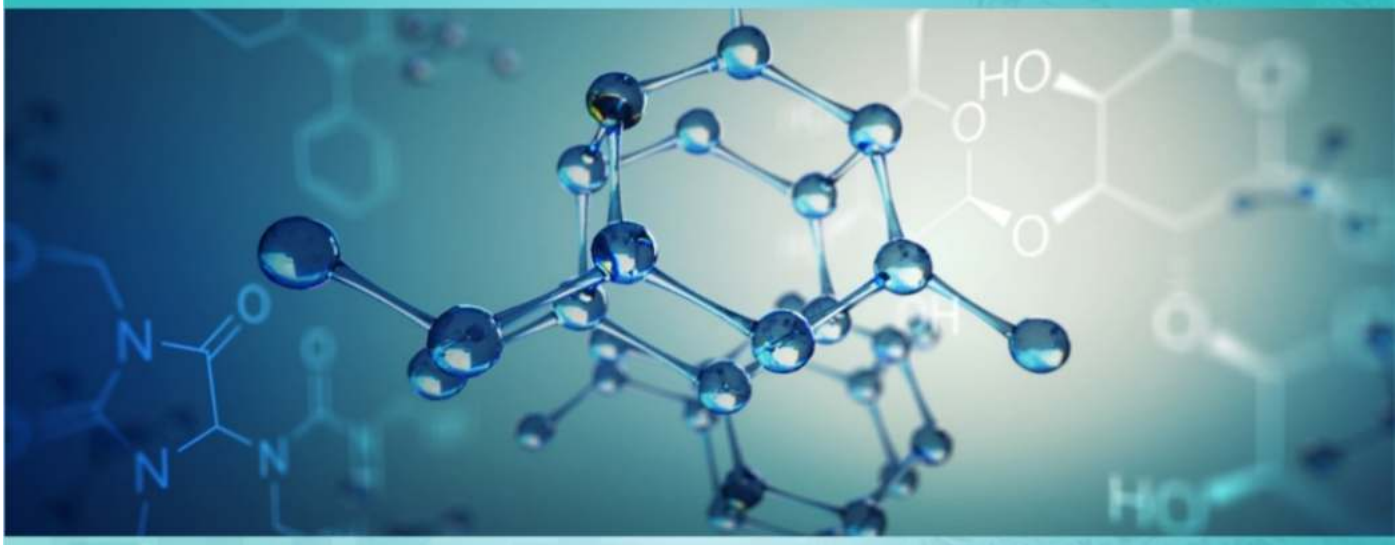

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