

Outcome Analysis Of Splenectomy In Paediatric Patients With HIV, Hepatitis B, Hepatitis C Either Singly Or In Combination- A Prospective Study

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Abstract

Introduction: Spleen is an essential organ in the body for its haematopoietic, immunological and scavenger action. It is seen that those persons without spleen –either congenitally or spleen removed anytime later in life for any reason are facing many problems- one of them is depressed immunity. Splenectomised patients have all range of infections- starting from minor chest or urinary tract or wound infection to life threatening OPSI, leading to increased morbidity and mortality- seen in both paediatric as well as adult patients.

Materials and Methods: Immunocompromised patients (with HIV, Hepatitis B, Hepatitis C infection) with splenomegaly and sero negative cases with splenomegaly who needed splenectomy for any reason attending Pediatric Surgery OPD and admitted to Paediatric Surgery department of MCH for splenectomy. Total number of patients with immunocompromization and splenomegaly admitted to paediatric surgery Department of MCH during our study period, was 25 cases. We have considered 25 sero negative cases who had undergone splenectomy for any indication during this period, as the control group.

Results: Our present study did not show any evidence that splenectomy in sero positive cases caused so much immuno suppression that the patients became very much prone to clinically evident major/ overwhelming infection. Vis a vis, complication rates were found to be insignificant/almost comperable in these two groups.

Conclusion: So, based on the above facts of this study, we conclude that neighthor chronic Hepatitis B, Hepatitis C, HIV-either singly or in combination have any clinically or statistically significant adverse effect on post-operative outcome of splenectomy patients, nor splenectomy causes acceleration or aggravation of natural history of these chronic diseases.

Key Words: Spleen, OPSI, HIV, Hepatitis, mortality, morbidity

Date of Submission: 07-11-2019

Date of Acceptance: 23-11-2019

I. Introduction

Spleen is an essential organ in the body for its haematopoietic, immunological and scavenger action. It is seen that those persons without spleen –either congenitally or spleen removed anytime later in life for any reason are facing many problems- one of them is depressed immunity. Splenectomised patients have all range of infections- starting from minor chest or urinary tract or wound infection to life threatening OPSI, leading to increased morbidity and mortality- seen in both paediatric as well as adult patients. Paediatric patients being more susceptible to infection due to their less innate immunity as compared to their adult counterpart will be further at risk if their spleen is also sacrificed due to any reason. So far as immunological functions are concerned, spleen contributes to both cellular as well humoral immunity.

The aim of our study is to explore the effect of sero positivity on the post operative outcome of splenectomy in terms of complications and also to find if splenectomy at all accelerates the natural history of Hepatitis B,C and HIV- if the patients happened to be sero positive pre-operatively.

II. Materials And Methods

Study Area: Department of Paediatric Surgery, Medical College & Hospital, Kolkata.

Study population: Immunocompromised patients (with HIV, Hepatitis B, Hepatitis C infection) with splenomegaly and sero negative cases with splenomegaly who needed splenectomy for any reason attending Pediatric Surgery OPD and admitted to Paediatric Surgery department of MCH for splenectomy.

Study period: January 2016 to December 2017.

Sample size: Total number of patients with immunocompromization and splenomegaly admitted to paediatric surgery Department of MCH during our study period, was 25 cases. We have considered 25 sero negative cases who had undergone splenectomy for any indication during this period, as the control group.

Sample design:

A. Inclusion criteria: All immunocompromised and sero negative patients with splenomegaly undergoing splenectomy.

B. Exclusion criteria: The only exclusion criteria is those patients who needed splenectomy for any indication but unfit for anaesthesia due to any reason.

Study design: Institution based prospective observational study .

Parameters to be studied:

1. Wound infection
2. Wound discharge, swelling and tenderness
3. Drain site infection
4. Chest infection
5. IV canula site infection
6. Urinary tract infection
7. Infection to any other site
8. Serum electrolytes, LFT, PT, APTT, complete haemogram.
9. Time taken for returning of the normal intestinal peristalsis sound.

STUDY TOOLS

1. Informed consent from their guardians.
2. Performa for relevant history & clinical examination
3. Weight machine, Measuring tape, BP machine, stethoscope
4. Predetermined Performa for tabulation of data
5. Statistical analytical tables

STUDY TECHNIQUES

Immunocompromised patients with splenomegaly having HIV, Hepatitis B, Hepatitis C infection and sero negative patients with splenomegaly who needed splenectomy for any reason were evaluated clinically, haematologically and radiologically, followed by preoperative assesement. Finally postoperative outcome like morbidity and mortality and intervention if any, were assessed. Various data collected and tabulated for results and analysis .

PLAN FOR ANALYSIS OF DATA

Simple comparative analysis of gathered data was done by following standard statistical protocol, to evaluate post operative outcome between post splenectomised patient with or without HIV, Hepatitis B, Hepatitis C infection either singly or in combination. The study was conducted also to find out the post operative morbidity and mortality of the study population .Appropriate statistical tests were done depending on the nature of data accordingly.

III. Results

The study was conducted in the Department of Paediatric Surgery, Medical College & Hospital, Kolkata, between January 2016 to December 2017 with 25 sero positive and 25 sero negative cases.

Table 1: Shows the age group wise distribution of the study Population

Sero Positive				N= 25			
1-3 Year	4-6 Year	7-9 Year	10-12 Year	1-3 Year	4-6 Year	7-9 Year	10-12 Year
3	8	10	4				

The total population was devided in four age group-1-3,4-6,7-9 and 10-12 years in both sero positive and sero negative group. In the sero positive group the distribution of cases in 1-3,4-6,7-9 and 10-12 years were 3,8,10 and 4 respectively (Fig-1).

Figure: 1 Age group wise distribution of the study population (sero positive)

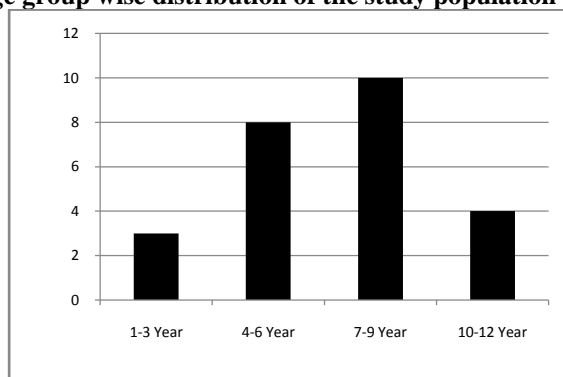


Table: 2-Age group wise distribution of the study Population (sero negative)
Sero Negative N= 25

1-3 Year	4-6 Year	7-9 Year	10-12 Year
4	11	7	3

In the sero negative group the distribution of cases in 1-3,4-6,7-9 and 10-12 years were 4,11,7,3 respectively (Fig-2).

Figure: 2-Age group wise distribution of the study Population (sero negative)

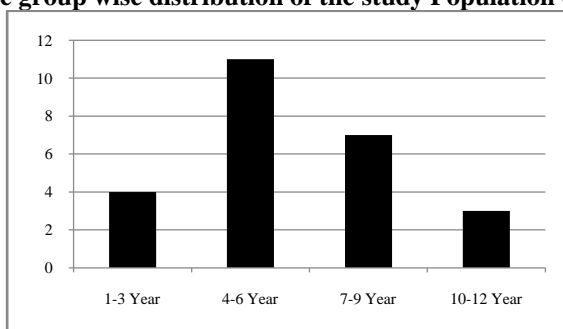


Table 3: Age wise distribution of the study Population

Age Group	Sero Positive(N=25)	Sero Negative(N=25)
1-3 years	3 ➤ Male=2 , Female=1	4 ➤ Male=3 , Female=1
4-6 years	8 ➤ Male=6 , Female=2	11 ➤ Male=4 , Female=7
7-9 years	10 ➤ Male=6 , Female=4	7 ➤ Male=6 , Female=1
10-12 years	4 ➤ Male=3 , Female=1	3 ➤ Male=3 , Female=0

In the sero positive population in the age group 1-3 years out of 3 patients 2 were male and 1 was female, 4-6 years out of total 8 cases 6 were male and 2 were female, 7-9 years out of 10 patients 6 were male and 4 were female, 10-12 years out of 4 patients 3 were male and 1 was female.

In the sero negative population in the age group 1-3 years out of 4 patients 3 were male and 1 was female, 4-6 years out of total 11 cases 4 were male and 7 were female, 7-9 years out of 7 patients 6 were male and 1 was female, 10-12 years out of 3 patients 3 were male and there was no female.

Table 4: Distribution of Hepatitis B, Hepatitis C and HIV
Sero Positive N= 25

Hepatitis B	Hepatitis C	HIV	Combination
5	6	8	6

In the sero positive population-out of total 25 cases, there were 5 Hepatitis B,6 Hepatitis C,8 HIV and 6 combination cases (Fig-3).

Figure: 3 Distribution of Hepatitis B, Hepatitis C and HIV in sero positive cases

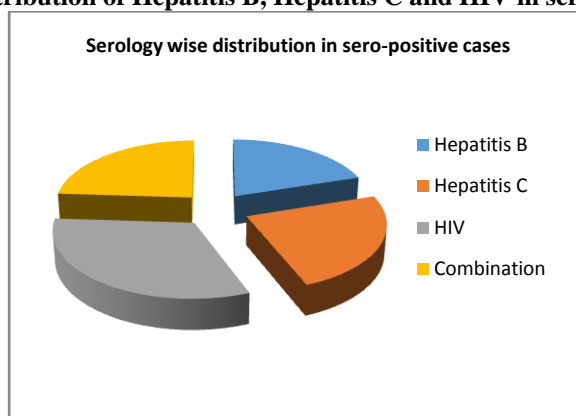


Table 5: Distribution of indications of splenectomy of the study population

Disease	Number
Thalassemia	15
Chronic ITP	4
Splenic abscess	2
Splenic cyst	1
Splenic trauma	3

The indications of splenectomy varied among both the groups. In the sero positive group there were 15 thalassemia, 4 chronic ITP, 2 splenic abscess, 1 splenic cyst, 3 splenic trauma (Fig-4).

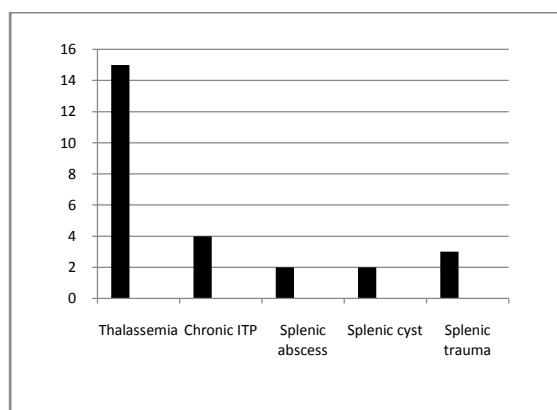


Fig: 4-Distribution of indications of splenectomy in sero positive cases

Sero Negative N=25

Disease	Number
Thalassemia	14
Chronic ITP	4

Splenic abscess	2
Splenic cyst	2
Splenic trauma	3

In the sero negative group there were 14 thalassemia, 4 chronic ITP, 2 splenic abscess, 2 splenic cyst, 3 splenic trauma (Fig-5).

Fig 5: Distribution of indications of splenectomy in sero negative cases

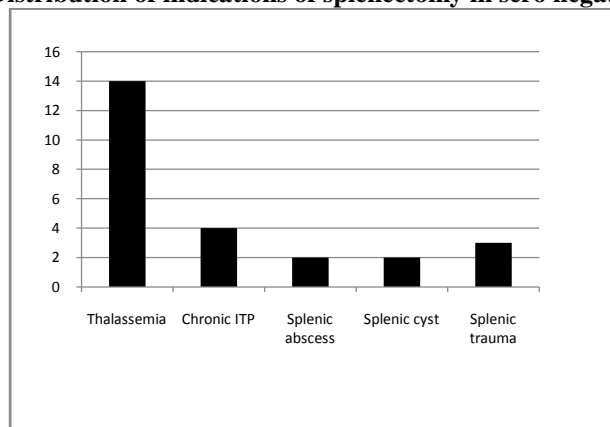


Table 7: Distribution of haematological and non-haematological indications of splenectomy among sero negative patients

Sero Negative (N= 25)

Haematological Indication (N=18)	Non- haematological Indication (N= 7)
➤ Thalassemia=14	➤ Trauma=3
➤ Chronic ITP=4	➤ Splenic abscess=2
	➤ Splenic cyst=2

Splenectomy was done both for haematological (Thalassemia, Chronic ITP) as well as non-haematological indications (splenic trauma, splenic cyst, splenic abscess). Of the sero-negative population haematological indications was 18 (Thalassemia=14, Chronic ITP=4) and non-haematological indications was 7 (splenic abscess=2, splenic cyst=2, splenic trauma=3)-[Fig-6].

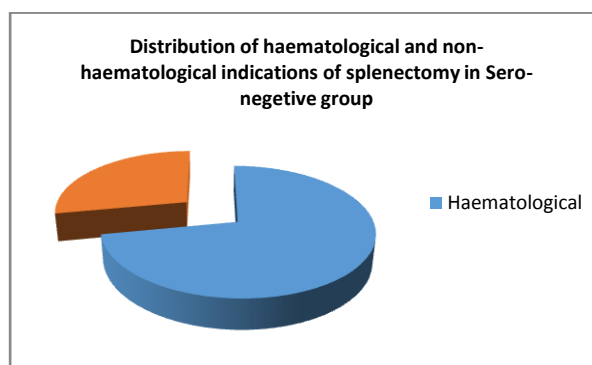


Fig- 6- Indications of splnectomy in sero negative cases

Distribution of haematological and non-haematological indications of splenectomy among Hepatitis B positive patients

Hepatitis B (N=5)

Haematological Indication (N=3)	Non- haematological Indication (N=2)
➤ Thalassemia=1	➤ Splenic abscess=1
➤ Chronic ITP=2	➤ Splenic cyst=1

Of the sero-positive population- among the Hepatitis B infected cases haematological indications was 3 (Thalassemia=1, Chronic ITP=2) and non-haematological indications was 2 (Splenic abscess=1, Splenic cyst=1)-[Fig-7].

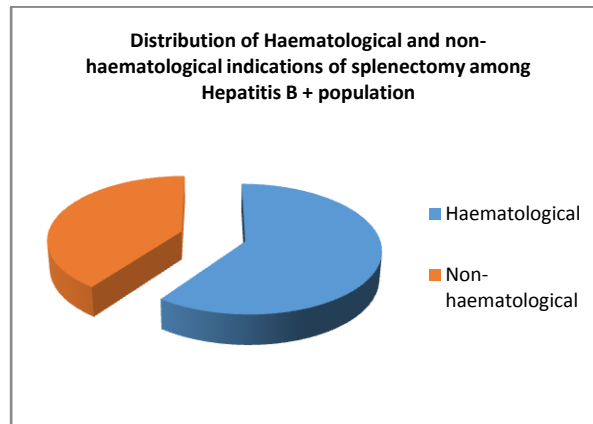


Fig: 7- Indications of splenectomy in Hepatitis B cases

Distribution of haematological and non-haematological indications of splenectomy among Hepatitis C positive patients

Hepatitis C (N=6)

Haematological Indication (N=4)		Non- haematological Indication (N=2)	
>	Thalassemia=3	>	Splenic abscess=1
>	Chronic ITP=1	>	Splenic trauma=1

Among the Hepatitis C infected cases haematological indications was 4 (Thalassemia=3, Chronic ITP=1) and non-haematological indications was 2 (Splenic abscess=1, Splenic trauma=1)-[Fig-8].

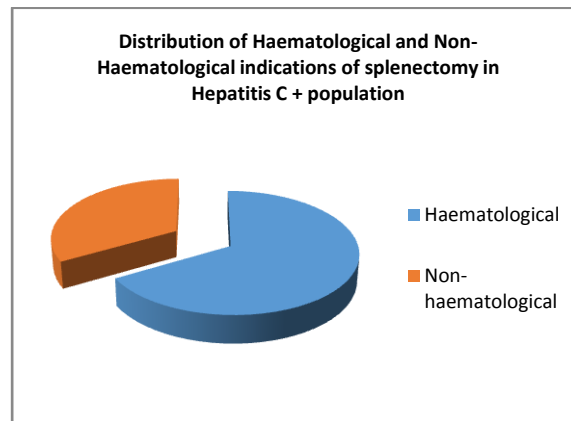


Fig: 8- Indications of splenectomy in Hepatitis C cases

Distribution of haematological and non-haematological indications of splenectomy among HIV positive patients

HIV (N=8)

Haematological Indication (N=6)		Non-haematological Indication (N=2)	
>	Thalassemia=5	>	Trauma=2
>	Chronic ITP=1		

Among the HIV infected cases haematological indications was 6 (Thalassemia=5, Chronic ITP=1) and non-haematological indications was 2 (Splenic trauma=2)-[Fig-9].

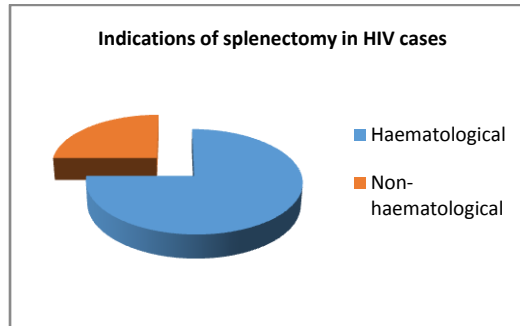


Fig: 9 Haematological indications of splenectomy in HIV cases

Distribution of haematological and non-haematological indications of splenectomy among combined positive patients

Combination (N=6)	
Haematological Indication (N=6)	Non- haematological Indication (N=0)
Thalassemia=6	NIL

Among the combined infected cases haematological indications was 6 (Thalassemia=6) and non-haematological indications was nil.

Table 8: Distribution of emergency splenectomy among sero negative, Hepatitis B, Hepatitis C, HIV, Combined patients among the study Population

Sero Negative (N=25)	Hepatitis B (N=5)	Hepatitis C (N=6)	HIV (N=8)	Combination (N=6)
5	1	2	2	0

In our study, splenectomy was done for emergency indication as splenic trauma and splenic abscess. Incidence of emergency splenectomy among groups are- sero negative 5, Hepatitis B 1, Hepatitis C 2, HIV 2, combination nil (Fig-14).

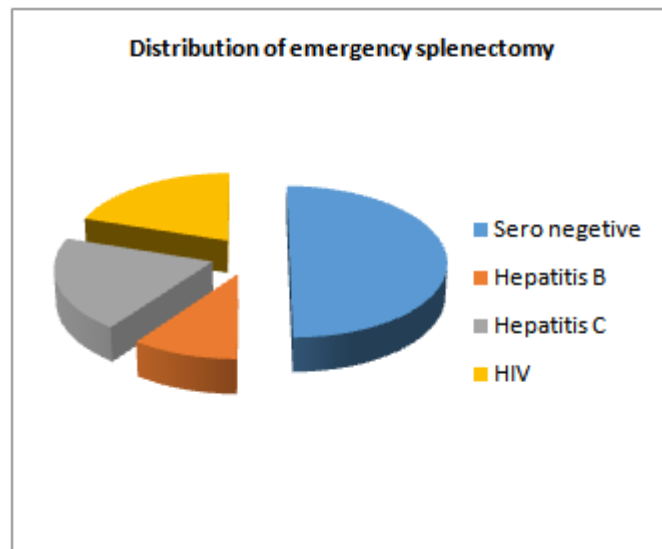


Fig: 10 Distribution of emergency splenectomy among study population

IV. Discussion

The aim of the study was to assess post-operative outcome analysis of splenectomy in Hepatitis B , Hepatitis C and HIV-(either singly or in combination), in compared to the control population. The outcome analysis was restricted to various clinical paramaters including infective complications- may it be wound infection, superficial infections and any deep organ specific infection, or any other wound related complications like delayed wound healing, burst abdomen or any other complications like atelectasis, deep vein thrombosis,

acute gastric dilatation, prolonged ileus, re-appearance of hypersplenism etc. So, the principle theme of our present study was to investigate whether these chronic infections (Hepatitis B, Hepatitis C, HIV) affect the outcome of splenectomised patients done for any indications, anyway.

In our study, we have allocated all patients into 2 arms-25 in each arm-one group (control) sero negative and the other group sero positive (either singly or in combination) and analysed the post operative results of each group and compared them accordingly.

In this present study, we had followed our patients both clinically as well as by laboratory and radiological investigations. Routinely we had done pre-operative serology (Hepatitis B, Hepatitis C, HIV), complete blood count with particular reference to the haemoglobin and platelet count, coagulation profile (PT, APTT and INR), 2-D Echo, Serum Ferritin level and used to vaccinate all of our patients to be undergone splenectomy against Hemophilus influenzae, Meningococcus, Pneumococcus, Hepatitis B to avoid OPSI & post-operative complete blood count- with particular reference to the platelet count and post operative haemoglobin level, urea and creatinine, sodium and potassium and some special investigations like CD4 count, Hepatitis C RNA titre, certain markers like HbeAg, liver function test, chest X ray, ultrasonography whole abdomen, blood/urine/sputum culture in special cases/where indicated. Our target for this study was 2 way- whether Hepatitis B, Hepatitis C or HIV infection affect splenectomy post operative period or splenectomy causes progression of these infections anyway.

We had observed some complications in our study, out of those complications which can happen in a splenectomised patient. However in the present study we have not considered those complications directly attributable to the surgical procedures- may it be immediate or distant, including those of infective and non-infective complications. We tried to extrapolate all of the said complications in causal relationship with the infection status (sero positive or sero negative).

Major findings of our study were-

1. The major indication of splenectomy in our study was Thalassemia in both the group (sero-positive and sero-negative).
2. The other indications were chronic ITP and non-haematological conditions like splenic abscess, splenic trauma and splenic cyst.
3. There was no major difference of minor and major infection among the sero-positive and sero-negative population.
4. Other non-infectious complications were almost same in between these two groups.
5. Hospitalisation period, duration of analgesia required during the post operative period, requirement of blood transfusion were almost the same in between these two groups.
6. There was no evidence that the chronic Hepatitis B, C and HIV became progressive and more virulent as reflected by HbeAg, Hepatitis C RNA titre and CD4 count as compared to the pre-operative level.
7. There was no evidence that sero-positive group had more wound related problems, more re-admission rate due to re-appearance of original symptoms or surgical complications.
8. There was no evidence that sero-positive group needed more medical/surgical intervention in the post operative period, due to surgical complications in compared to the sero-negative group.
9. There were no major difference of complications in between the Hepatitis B, C, HIV or combined subgroup.
10. There was no major difference of complication free discharge in between the sero-positive and sero-negative groups.
11. No mortality or OPSI were noted in either of the group.
12. No DVT or any other related haematological abnormality was noted during the post operative period in either of the group.

V. Conclusion

Our present study did not show any evidence that splenectomy in sero positive cases caused so much immuno suppression that the patients became very much prone to clinically evident major/ overwhelming infection. Vis a vis, complication rates were found to be insignificant/almost comparable in these two groups.

So, based on the above facts of this study, we conclude that neither chronic Hepatitis B, Hepatitis C, HIV-either singly or in combination have any clinically or statistically significant adverse effect on post-operative outcome of splenectomy patients, nor splenectomy causes acceleration or aggravation of natural history of these chronic diseases.

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