

# ***Evaluation of Neurosurgical Infection***

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**Now The Neurosurgical patients manifests a Sub Clinical Infection before surgery, confirmed by Microbiological Methods. A high inflammatory response showed by the patients undergoing surgery for brain, Spinal cord Lesion found to have very high elevated level's of CRP. The Prognosis of Neurosurgical patients having Brain, Spinal cord Lesion correllates with the High level of HSCRPA Promising parameter), The Infection rate, Inflammatory response Neurosurgical patients after surgery correlates with High level of ESR, The Inflammatory response, their level for Neurosurgical patients undergoing surgery correlates with a very elevated level's of , after surgery. A regular Sampling test is to be done to rule out the Careers from time to time.The Manifestation Sub clinical Infection before surgery shows a Lacuna in Antibiotic Prophylaxis and is associated with a preceding, strong, systemic inflammatory response. The presence of systemic inflammatory response is associated with increased recurrence and reduced survival of cancer patients. But, all the patients was detected for a Sub Clinical Infection before surgery.This is due to the better Immune response of varying biological factors associated, probably a Immunoenhanced manifestation. The higher the level of inflammation, the higher the level of CRP. A increase of CRP occurs after neurosurgery and is associated with a preceding, strong, systemic inflammatory response. The higher the level of inflammation, the higher the level of HSCRPA.This is a promising parameter regarding Infection Control. A increase of HSCRPA occurs after neurosurgery and is associated with a preceding, strong, systemic inflammatory response. All the patients show a high level of Inflammatory response confirmed by Serological, Haematological parameters namely CRP/HSCRPA, ESR, TC, DC. So, all patients are not safe as brain Tumor is concerned.**

**Kay words: Neurosurgical, CRP, HSCRPA, TC/DC, Haematological parameters, brain Tumor.**

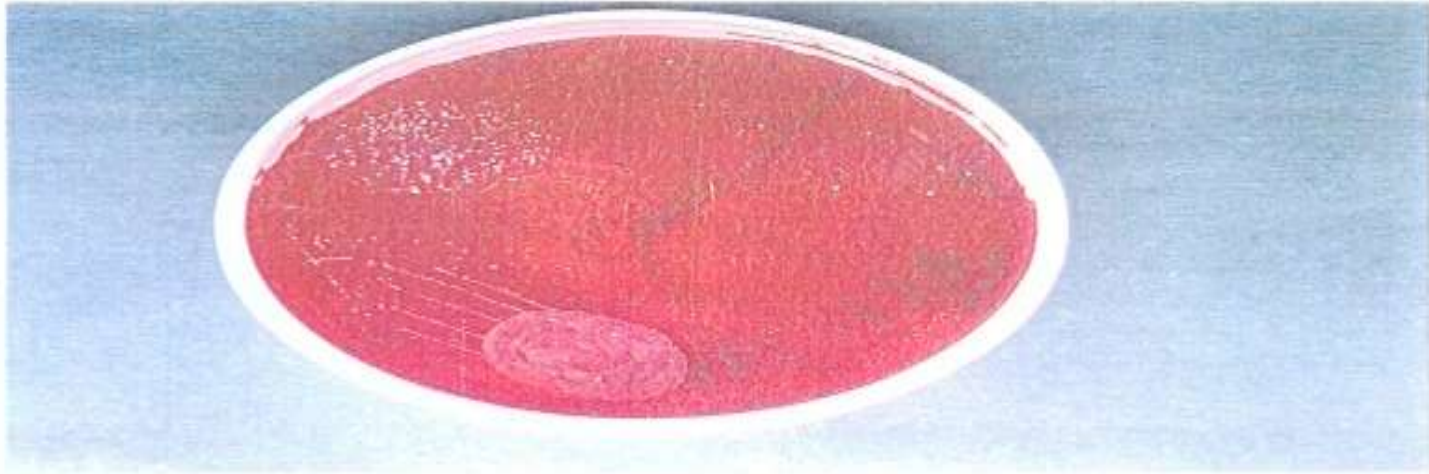
**1.The Neurosurgical patients manifests a Sub Clinical Infection before surgery, confirmed by Microbiological Methods.**

**Design: Prospective study.**

**Setting: Department of Neurosurgery.**

***Analysis:***

***Extrinsic and Intrinsic factors***



### **Gram Positive Cocci (GPC)**

- |                |   |                                  |
|----------------|---|----------------------------------|
| <b>Nose</b>    | - | <b>Short Chain and Pairs GPC</b> |
| <b>Skin</b>    | - | <b>No growth</b>                 |
| <b>Pharynx</b> | - | <b>GPC in Clusters</b>           |

## **Personnel Sampling**

1. Skin swab 栢oth fore arm and palms.
2. Nasal 栢oth anterior nares.
3. Pharynx 栢ropharynx.

## Results

One patient died in the Post-Op died due pathology of the disease(Intra Ventricular Meningioma).

One patient developed Bed Sore detected on SPOD.

Some patients have been discharged on the SPOD,so follow up is difficult.

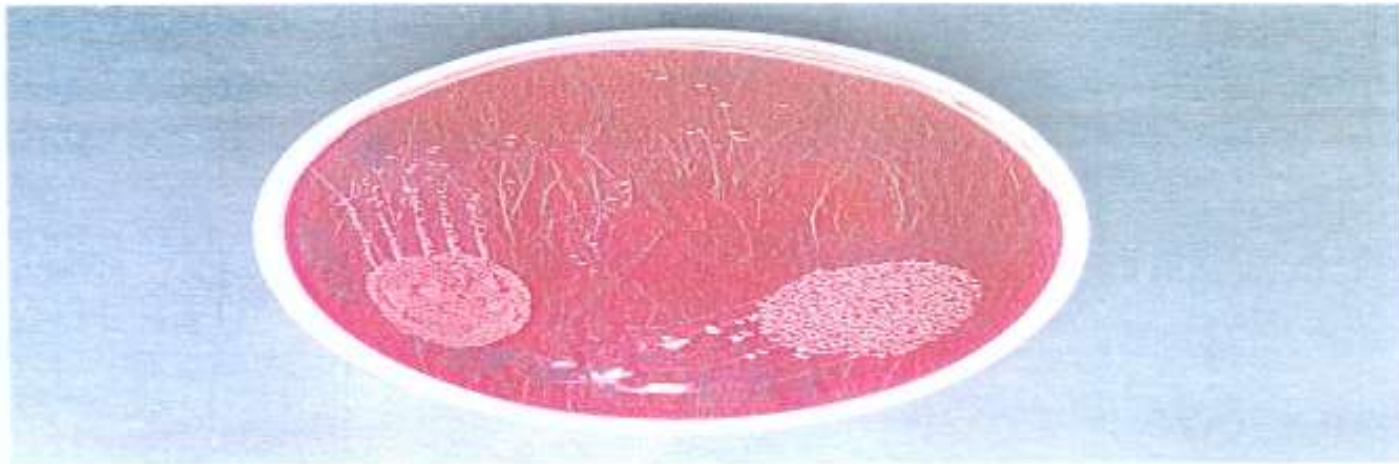
Some patients have been discharged after SPOD.

Two of them are (1 Doctor, 1 Scrub Nurse) to check for the careers in the Neuro Theatre.

Total 28 Cases, the Pharynx are Positive(78.57%) showing Profuse Growth for 22 patients

Total 28 Cases, the Nose are Positive(71.42%) showing Profuse Growth for 20 patients

***Among the 28 cases, the Profuse Growth is seen in one Neursurgical Resident and One Scrub Nurse. The Scrub Nurse is having a Moderate Growth in the Skin(Upper Limb-Lower Arm) after Hand Washing. The Bacteria detected here is Diptheroids.***



### **Gram Positive Cocci (GPC)**

- |                |   |                                 |
|----------------|---|---------------------------------|
| <b>Nose</b>    | - | <b>Short Chain and Clusters</b> |
| <b>Skin</b>    | - | <b>No growth</b>                |
| <b>Pharynx</b> | - | <b>Large GPC in Clusters</b>    |

## ***Air Sampling***

***The Results shows 200cfu/Plate in both sites viz.. Operating Table,Lobby Showing the Neuro Theatre Atmosphere as a Highly Infected area which cannot be compromised in any way.***

## ***Tap Water***

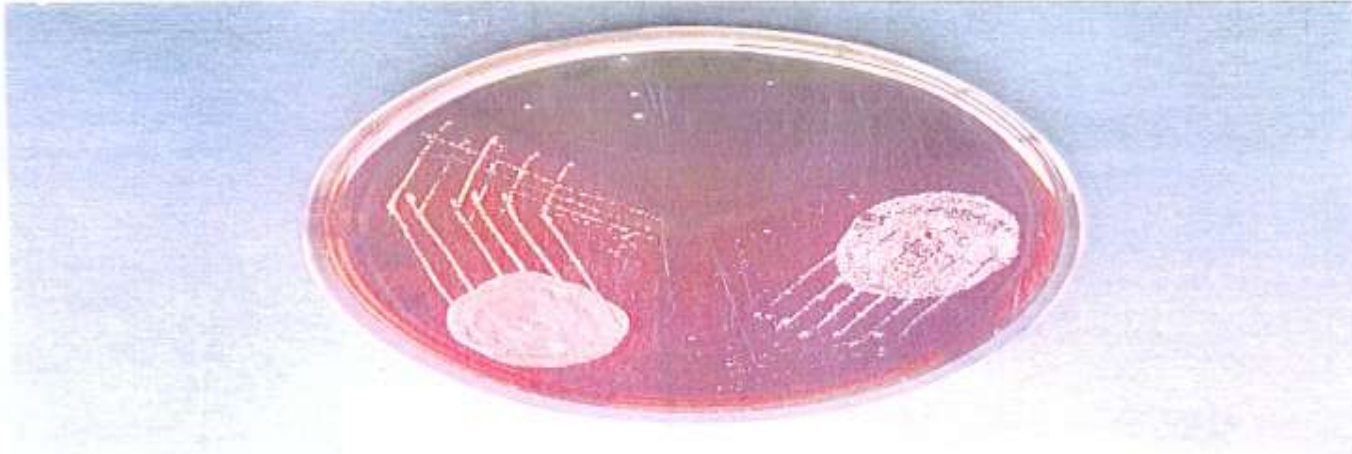
***The Results shows the presence of Neurosurgical pathogens.This is a place for effective transfer of pathogens to all Operation Theatre staff□ who cannot escape from this barrier(Coagulase Negative Staph(CNS)).***





### **Gram Positive Cocci (GPC)**

- |                |   |                                    |
|----------------|---|------------------------------------|
| <b>Nose</b>    | - | <b>GPC in Pairs and Clusters</b>   |
| <b>Skin</b>    | - | <b>Short Chain and Clusters</b>    |
| <b>Pharynx</b> | - | <b>GPC in Cluster and Tetrades</b> |



### **Gram Positive Cocci (GPC)**

- |                |   |                                       |
|----------------|---|---------------------------------------|
| <b>Nose</b>    | - | <b>GPC in Cluster and Short Chain</b> |
| <b>Skin</b>    | - | <b>No growth</b>                      |
| <b>Pharynx</b> | - | <b>GPC in Pairs seen</b>              |

# ***Measurements and Main Results:***

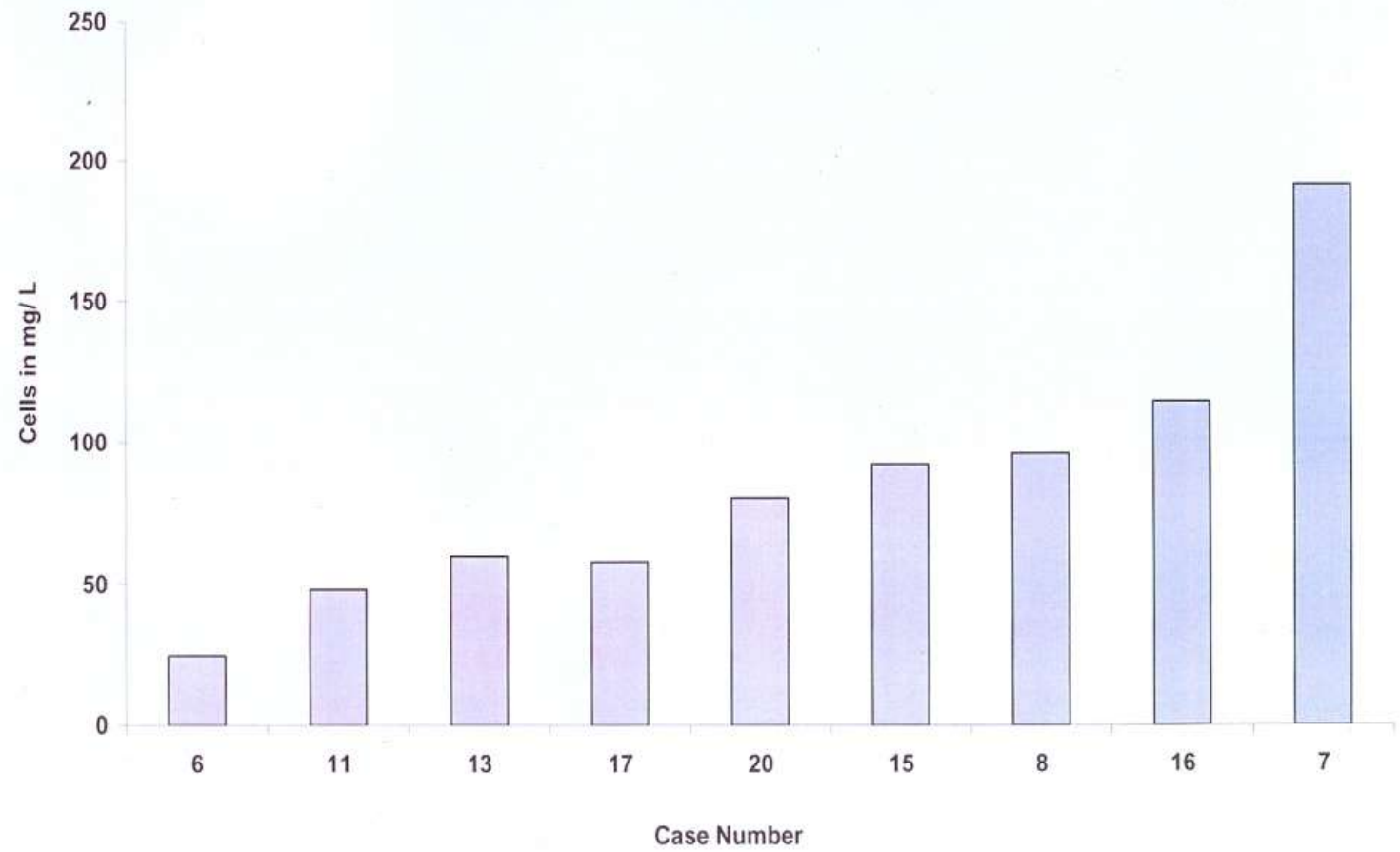
***All the patients was detected for  
a Sub Clinical Infection  
before surgery.***

***The Colony Count is 10 power 5,  
and above.***

***Normal Flora the Colony Count is  
10 power 2 Only.***

***2. A high inflammatory response showed by the patients undergoing surgery for brain, Spinal cord Lesion found to have very high elevated level's of CRP.***

### Variance in CRP



## **Results**

**One patient died in the Post-Op died due pathology of the disease(Intra Ventricular Meningioma).**

**One patient developed Bed Sore detected on SPOD.**

**Some patients have been discharged on the SPOD,so follow up is difficult.**

**Some patients have been discharged after SPOD.**

**Total 15 Cases, 15 are Positive(100%).**

**The Values are very High showing all the patients subjected to High risk Infection.The is a Non-Specific Test, an Infection control Marker with respect to Post-Op Ward.**

## ***Measurements and Main Results:***

***All the patients was detected for a High Inflammatory response.***

***All the patients show a high level of Inflammatory response confirmed by Serological parameter, CRP. So, all patients are not safe and prone to Infection.***

***This is due to the pathology of the disease , a Non Modifying factor.***

***The presence of systemic inflammatory response is associated with increased recurrence and reduced survival of cancer patients.***

***The inflammation concluded that markers of chronic inflammation (such as CRP/HSCR) can predict the chance of getting cancer and the chance of recovery – no matter what stage the tumor is in. The lower the cytokine inflammation level is, the greater the chance of recovery.***

***But, all the patients was detected for a Sub Clinical Infection before surgery.***

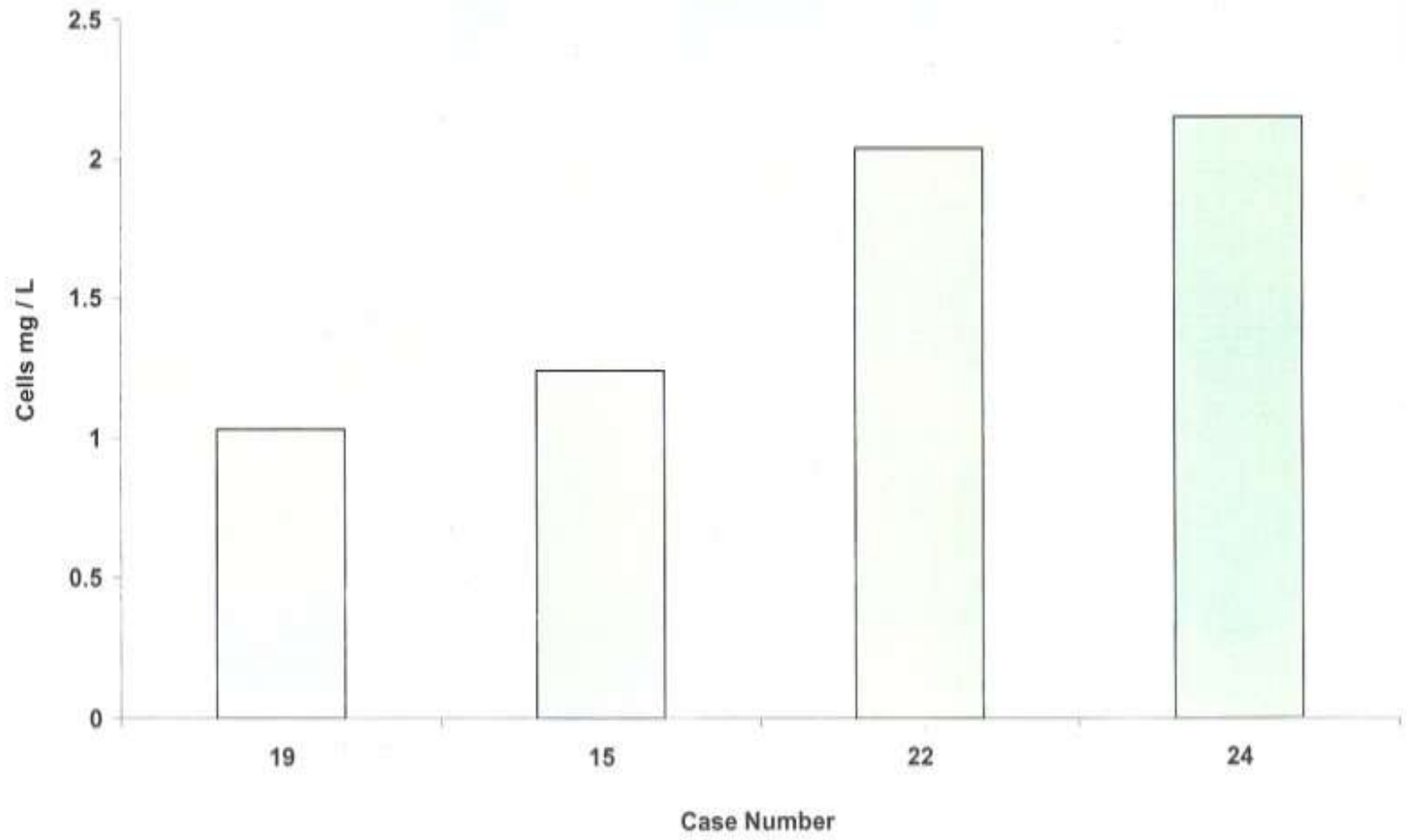
***This is due to the better Immune response of varying biological factors associated, probably a Immunoenhanced manifestation.***



***3.The Prognosis of  
Neurosurgical patients having  
Brain, Spinal cord Lesion  
correllates with the High level  
of HSCRPA Promising  
parameter)***

The inflammation concluded that markers of chronic inflammation (such as CRP/HSCRPA) can predict the chance of getting cancer and the chance of recovery – no matter what stage the tumor is in. The lower the cytokine inflammation level is, the greater the chance of recovery.

### Variance in HSCR



## ***Measurements and Main Results:***

***All the patients was detected for a High Inflammatory response.***

***All the patients show a high level of Inflammatory response confirmed by Serological parameter, HSCRP.***

***This is due to the pathology of the disease , a Non Modifying factor.***

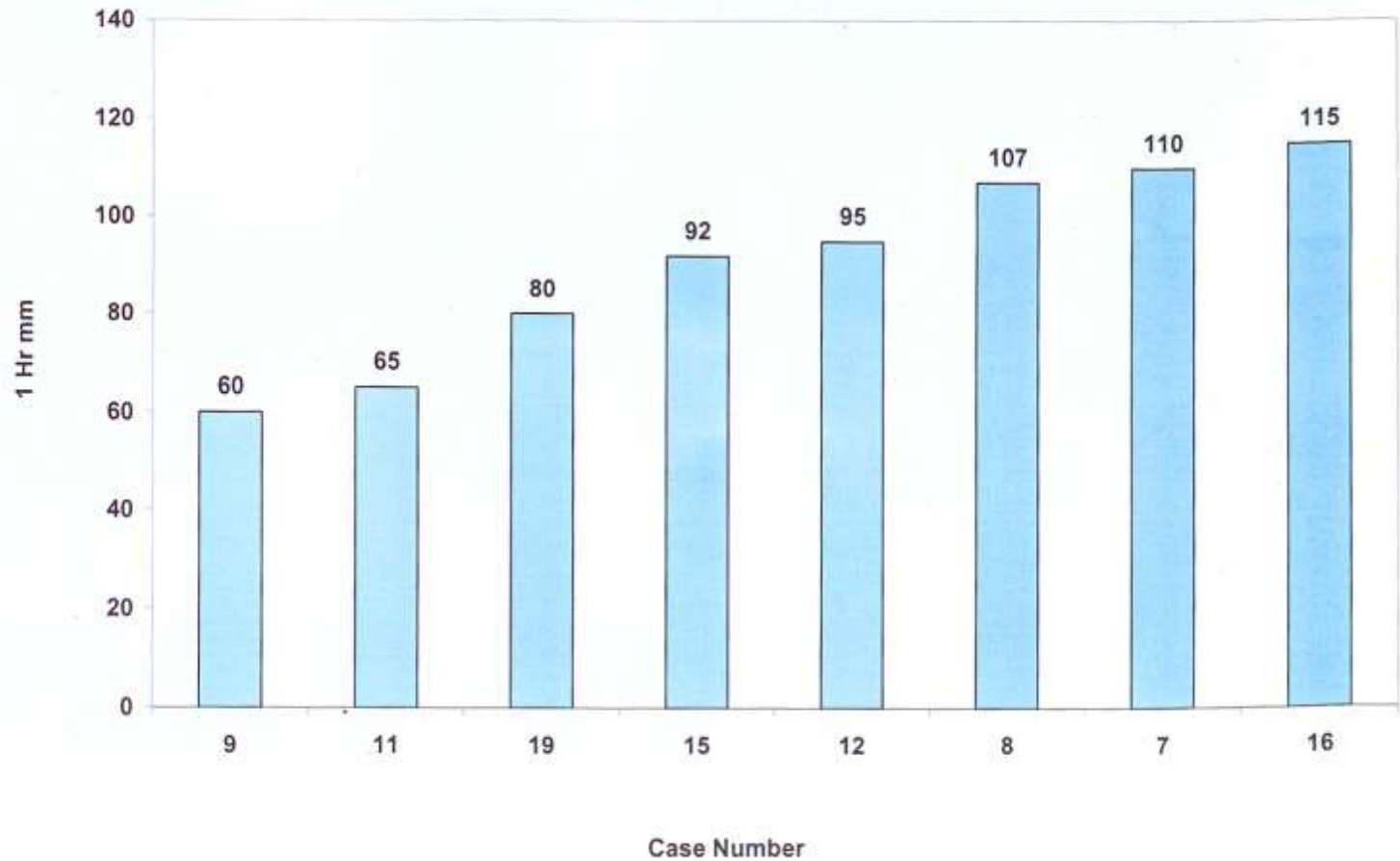
## **Results**

***Total 10 Cases, 4 are Positive(40%).  
The Values are very High showing 4  
patients subjected Medium risk of  
Infection.***

***The is a Non-Specific Test, an  
Infection control Marker with  
respect to Post-Op Ward.***

***4.The Infection rate,  
Inflammatory response  
Neurosurgical patients  
after surgery correlates  
with High level of ESR.***

### Variance in ESR



## **Measurements and Main Results:**

**All the patients show a high level of Inflammatory response confirmed by Haematological parameter ESR.**

## **Results**

***One patient died in the Post-Op died due pathology of the disease(Intra Ventricular Meningioma).***

***One patient developed Bed Sore detected on SPOD.***

***Some patients have been discharged on the SPOD,so follow up is difficult.***

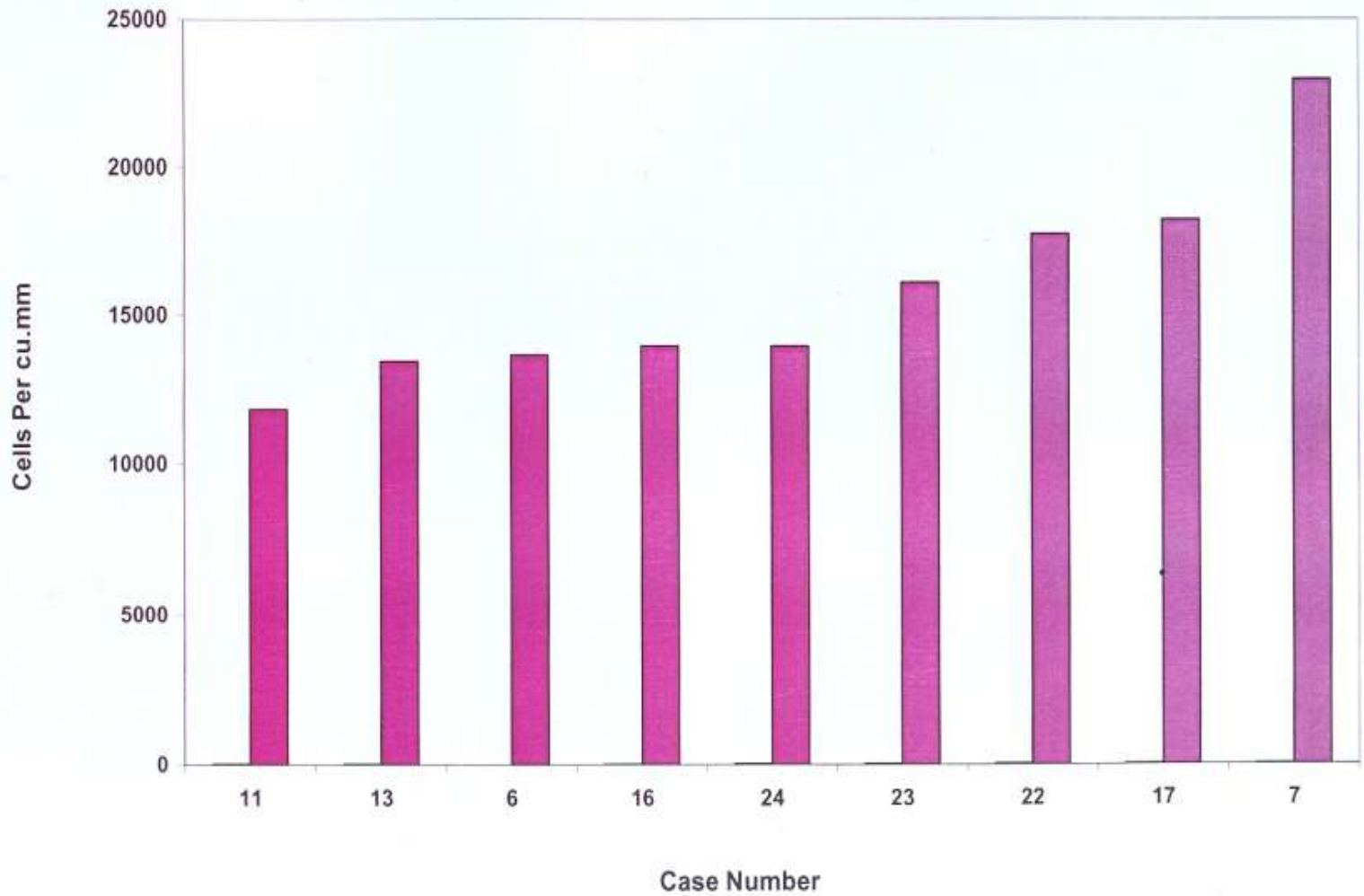
***Some patients have been discharged after SPOD.***

***Total 25 Cases, 20 are Positive(80%).  
The Values are very High showing 20 patients subjected High of Infection.***

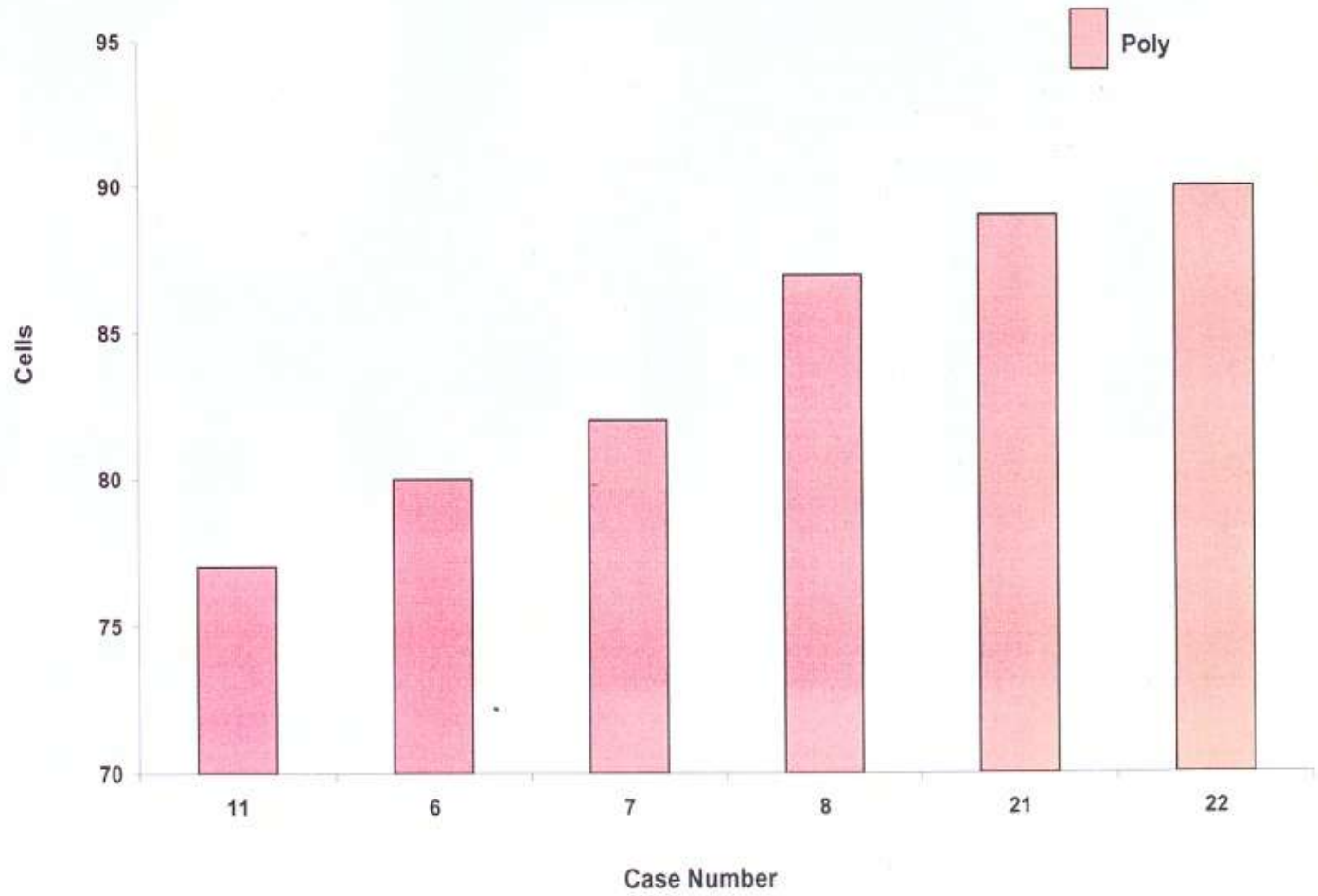


***5.The Inflammatory response, their level for Neurosurgical patients undergoing surgery correlates with a very elevated level's of TCIDC after surgery.***

Variation in TC



### Variation in DC



## ***Measurements and Main Results:***

All the patients was detected for a Sub Clinical Infection before surgery.

The Colony Count is 10 power 5, and above.

Normal Flora the Colony Count is 10 power 2 Only.

All the patients show a high level of Inflammatory response confirmed by Serological,Haematological parameters namely CRP/HSCR,ESR,TC, DC.

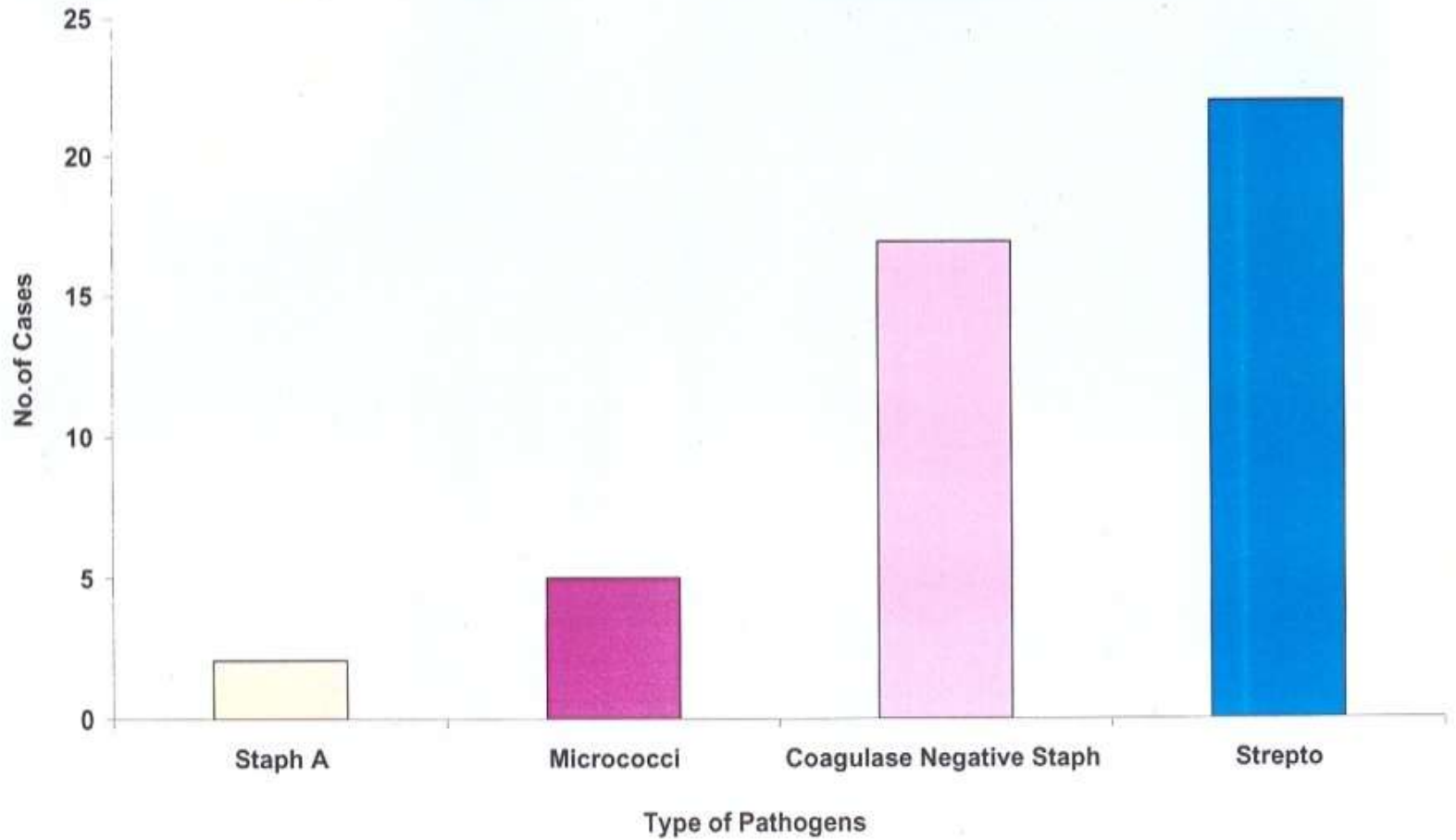
So, all patients are not safe as brain Tumor is concerned.

## **Results**

***Total 25 Cases, 17 are Positive(68%).  
The Values are very High showing 17  
patients subjected High of Infection.***

***Total 25 Cases, 18 are Positive(72%).  
The Values are very High showing 18  
patients subjected High of Infection.***

### Total Distribution due to *Profuse Growth* of NEURO SURGICAL PATHOGENS



## EPIDEMIOLOGICAL STUDY

**TABLE - I**  
**SEXWISE DISTRIBUTION**

Serial No.	Genders	No of Cases	Percentage
1	Male	28	56%
2	Female	22	44%
		<b>Total → 50</b>	

**TABLE - II**  
**AGEWISE DISTRIBUTION**

Serial No.	Age Groups	Male	Female	Percentage	
				Male	Female
	1M- 12M	1	0	2%	0%
	5-15	2	0	4%	0%
	16-30	3	6	6%	12%
	30-45	10	7	20%	14%
	46-60	9	2	18%	4%
	61-75	4	5	8%	10%
	76-90	0	1	0%	2%
	<b>Total</b>	<b>29</b>	<b>21</b>	<b>58%</b>	<b>42%</b>

**TABLE - III**  
**Typewise of Brain Tumours**

Serial No.	Brain Tumours	No of Cases
1	Meningioma	5
2	SOL	13
3	ANF	3
4	Others	31

**Note:-**

**SOL:- Space Occupying Lesion**

**ANF:- Acoustic Neuro Fibroma**

**Others:- Includes Fractures, Hemorrhage Etc.**

**TABLE - IV**  
**Types of Procedures**

Serial No.	Procedures	No of Cases
1	Corpectomy	4
2	Laminectomy	5
3	Laminoplasty	1
4	Dissectomy	4
5	Craniectomy	12
6	Craniotomy	10
7	Shunt	4
8	Multiple Procedure	1
9	Burr Hole	6
10	STB	1
11	Rib Biopsy	1
12	AAF	1



**TABLE - V**  
**Types of Meningioma**

Serial No.	Meningioma's	No of Cases
1	Parietal Convexity(L)	1
2	Temporo-Parietal(L)	1
3	Frontal Convexity(L)	1
4	Myelo Meningioma	1
5	Transphenoidal	1

**TABLE - VI**  
**Types of SOL**

Serial No.	SOL	No of Cases
1	Parietal (L)	1
2	Fronto-Parietal(L)	1
3	Frontal (L)	1
4	Temporal@	2
5	CPA	2
6.	Hypothalamic	1
7.	Intervent Lesion	1
8.	Hypothalamic	1
9.	Post Frontal	1

## CLINICAL STUDY

**TABLE - VII**  
**CRP Distribution(Abnormal)**

Total	No. of Cases	Percentage
15	15	100%

**TABLE - VIII**  
**HSCR Distribution(Abnormal)**

Total	No. of Cases	Percentage
10	4	40%

**TABLE - IX**  
**ESR Distribution(Abnormal)**

Total	No. of Cases	Percentage
25	20	80%

**TABLE - X**  
**TC Distribution(Abnormal)**

<b>Total</b>	<b>No. of Cases</b>	<b>Percentage</b>
25	17	69%

**TABLE - XI**  
**DC Distribution(Abnormal)**

<b>Total</b>	<b>No. of Cases</b>	<b>Percentage</b>
25	18	72%

**TABLE - XII**  
**Sitewise Bacterial Distribution**

<b>Site</b>	<b>Profuse Growth</b>	<b>Percentage</b>
Skin	4	14.28%
Pharynx	22	78.57%
Nose	20	71.42%
	<b>Total → 28</b>	

# **Conclusions:**

**1. A regular Sampling test is to be done to rule out the Careers from time to time. The Manifestation Sub clinical Infection before surgery shows a Lacuna in Antibiotic Prophylaxis and is associated with a preceding, strong, systemic inflammatory response.**

**2. The presence of systemic inflammatory response is associated with increased recurrence and reduced survival of cancer patients.**

***3. But, all the patients was detected for a Sub Clinical Infection before surgery.***

***This is due to the better Immune response of varying biological factors associated, probably a Immunoenhanced manifestation.***

***Note:-***

***This type Research using Microbiological Methods before Neurosurgery are first explored Only by us.***

***4.The higher the level of inflammation, the higher the level of CRP.***

***A increase of CRP occurs after neurosurgery and is associated with a preceding, strong, systemic inflammatory response.***

***5.The higher the level of inflammation, the higher the***

***level of HSCRP.This is a promising parameter regarding Infection Control.***

***A increase of HSCRP occurs after neurosurgery and is associated with a preceding, strong, systemic inflammatory response.***

***All the patients show a high level of Inflammatory response confirmed by Serological, Haematological parameters namely CRP, IHS, CRP, ESR, TC, DC. So, all patients are not safe as brain Tumor is concerned.***

## ***Extrinsic factors***

**1.WHO STANDARDIZATION**

**2.NICU**

**3.CSSD**

**4.Paramedic education**

**5.Surgical consciousness**

**6.Neuro block**

**7.ICT**

**8.IC Manual**

**9.Conferences about IC.**

**10.Epidemiological markers.**

**11.Laboratory(High Tech)**

**12.Diagnostic center**

**13.Infection(Causes)**

**14.Clinico-microbiological corelation**

**15.Man power shortage**

**16.Surgeon's preference card.**



# ***Recommendation***

***1.Post-op***

***2.handwashing***

***3.Masking***

***4.Gloving.***

***5.Suction***

***6.Oxygenation***

***7.Traffic control***

***8.IV Line***

***9.Sampling test***

***10.Device problem***

***11.Environment--> AC Machine(Clostridium)***

***12.Neuro theatre***

***Location, LAV -V, wall, display board, Emergency trolley, surgical trolley, Anaesthetic trolley, Roof lights***

# ***American NeuroTheatre***

***1. Pole star N10 Systems  
(Third Generation. Fourth  
Generation now developed.)***

***-It is called iMRI.***

***-Gives superior definition of brain  
Topographical structures***

***-Detects Intra-op errors.***

***- It is Costly.***

***2. Robotics***

***3. Virtual Reality***

# **Appendix**

- 1.SPOD** – **Second post Operative day**
- 2.CFU** -- **Colony forming unit**
- 3.CNS** -- **Coagulase negative staphylococcus A.**
- 4. SOL** -- **Space occupying lesion**
- 5. TC** - **Total count(Blood)**
- 6-DC** -- **Differential count(Blood)**
- 7.ESR** -- **Erythrocyte sedimentation rate**
- 8.CRP** -- **C Reactive protein**
- 9.HSCRP** -- **Highly sensitive C Reactive protein**
- 10.CFU** --- **Colony forming Unit**

## "ნეიროქირურგიული ინფექციების ევოლუცია"

ს.მ.პირუბაბაძე, რ.რამამური

(ჩანნი, ინფექცი)

მოყვანილია ნეიროქირურგიული ინფექციის შეფასება ოპერაციამდე, პოსტოპერაციულ პერიოდში რომელთაც ჩაუტარდათ ტვინის სიმსივნის და ხერხემლის სიმსივნეზე ოპერაცია, მაღალი ანთებითი რეაქცია აჩვენებს C-რეაქტიული ცილის მაღალი მაჩვენებლის მქონე პაციენტებმა, რომელთაც ჩაუტარდათ ოპერაცია ტვინზე და ხერხემლზე. HSCRP მაღალი მაჩვენებლის მქონე თავის და ზურგის ტვინის დაზიანების მქონე ნეიროქირურგიულ პაციენტებთან დაკავშირებული პროგნოზი, ინფიცირების მაჩვენებელი, ანთებითი რეაქცია გამოსატყუი ESR-ის მაღალი დონით ნეიროქირურგიულ პაციენტებში ქირურგიული ჩარევის შემდეგ, ანთებითი რეაქცია გამოსატყუი TC/DC ამაღლებული დონით ნეიროქირურგიულ პაციენტებში ქირურგიული ჩარევის შემდეგ, პაციენტებს იკვლევდნენ ოპერაციამდე და პოსტოპერაციულ პერიოდში, რაც უფრო მაღალია ანთების დონე, მით მაღალია CRP, HSCRP, ESR დონე, მათი დონის გაზრდა ნეიროქირურგიული ჩარევის შემდეგ ასოცირდება წინმსწრებ, ძლიერ, სისტემურ ანთებით რეაქციასთან.

სისტემური ანთებითი რეაქცია ასოცირდება სიმსივნურ პაციენტებში სიმსივნური პროცესის განახლებასა და მათი გადარჩენის შესაძლებლობის შემცირებასთან. დასკვნის სახით შეიძლება განვაცხადოთ, რომ ქრონიკული ანთების ნიშნებმა (როგორცაა CRP/HSCRP) შესაძლოა მოახდინონ იმის პროგნოზირება თუ რამდენად დიდია სიმსივნის განვითარებისა და გამოჯანმრთელების შანსი – იმისდა მიუხედავად, თუ რომელ სტადიაზეა სიმსივნური პროცესი. რაც უფრო დაბალია ციტოკინის დონე, მით მაღალია გამოჯანმრთელების შანსი.

***Thanks***

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***Founder, Hod***

***Critical Care Medicine***

***TSMU, Georgia***