

Seasonal zoonotic disease scrub typhus in district- Narsinghpur, M.P.

Gulab Khatarkar, Yogesh Sharma,
Anshuman Sonare
Kunwar Singh Kushwaha,
DIST. EPIDMEMIOLOGIST, IDSP, DIST.
NARSINGHPUR and Team

ABSTRACT

Scrub typhus is a disease caused by bacteria called *Orientia tsutsugamushi*. It is spread to people through bites of infected chiggers (larval mites) Most common symptoms of scrub typhus include fever, headache, body aches, and sometimes rash. Most cases occur in rural areas of Southeast Asia, Indonesia, China, Japan, India and northern Australia. So Narsinghpur district is located in the central part of Madhya Pradesh in India. This includes very simple things like bathing at least daily, changing/washing your clothes on a regular basis, spray pest control in your yard and don't let your pets share your bed. Don't travel scrub typhus spread/affected area.

INTRODUCTION

1-INTRODUCTION-

Scrub typhus, also known as bush typhus, is a disease caused by a bacteria called *Orientia tsutsugamushi*. Scrub typhus is spread to people through bits of infected chiggers (larval mites). The most common symptoms of scrub typhus include fever, headache, body aches, and sometimes rash. Most cases of scrub typhus occur in rural areas of South East Asia, Indonesia, china, Japan, India, Sri Lanka and northern Australia, the Western Pacific Islands, Maritime area and several parts of South-Central Russia. Anyone living in or traveling to areas where scrub typhus is found could get infected.

Case definition

Acute undifferentiated febrile illness of 5 days or more (in which common etiologies such as dengue, malaria, and typhoid have been ruled out) With or without eschar should be suspected as a case of Rickettsial infection. (If eschar is present,)

- A dark, scab-like region at the site of the chigger bite (also known as eschar)
- Fever of less than 5 days duration should be considered as scrub typhus.) Other presenting features may be headache and rash, lymphadenopathy,
- Multi-organ involvement like liver, lung or kidney and encephalopathy in complicated cases.
- AND/OR Titres of 1:80* or above in OXK antigens by Weil Felix test may be an initial indication. A paired
- serology is advisable (* States can define their significant titres)

Most common symptoms of scrub typhus include

- fever,
- headache,
- body aches
- and sometimes rash.

Most cases of scrub typhus occur in rural areas of Southeast Asia, Indonesia, China, Japan, India and Northern Australia. Anyone living in or travelling to areas where scrub typhus is found could get infected.

Infection is spread through-

Scrub typhus- also known as bush typhus, is a disease caused by a bacteria called "Oruebtia tsytsugamushi". Scrub typhus is spread to people through bites of Infected chiggers (larval mites).

Intervention to prevent scrub typhus

Diagnosis and Testing-

- The symptoms of scrub typhus are similar to symptoms of many other diseases. If See the healthcare provider spreading the same symptoms or found the scrub typhus case in any area.

- If recently travelled the affected are.
- Blood/serum sample collection.

- Laboratory testing and reporting of results can take the several days, so health care provider may start treatment before results are available.

Treatment-

- Scrub typhus should be treated with the antibiotic doxycycline. Doxycycline can be used in persons of any age.
 - Antibiotics are most effective if given soon after symptoms begin.
 - People who are treated early with doxycycline usually recover quickly.

Prevention-

- No vaccine is available to prevent scrub typhus.
- Reduce your risk of getting scrub typhus by avoiding contact with infected chiggers.
- When travelling to areas where scrub typhus is common, avoid areas with lots of vegetation and brush where chiggers may be found.
Use Environmental Protection Agency (EPA)-registered insect repellent external icon containing DEET Or other active ingredients registered for use against chiggers, on exposed skin and clothing.
 - Always follow product instructions.
 - Reapply insect repellent as directed.
 - Do not spray repellent on the skin under clothing.
- If you are also using sunscreen, apply sunscreen

before applying insect repellent.

If you have a baby or child.

- Dress your child in clothing that covers arms and legs or cover crib, stroller and baby carrier with mosquito netting.
- Do not apply insect repellent onto a child's hands, eyes or mouth or on cuts or irritated skin.
- Adults: Spray insect repellent onto your hands and then apply to child's face. Hand wash properly.

About Narsinghpur:

Narsinghpur district is situated in the central part of Madhya Pradesh Madhya Pradesh is located in the Central part of India. Narsinghpur district holds a special importance being located in the Country. It attracts special attention because of its natural situation as well. On the Northern ends Vindhyachal on the southern ends through out the lengths are Satpura ranges of Mountains. In the Northern part river Narmada flows from East to West. Which is a sacred as holy as river Ganga. Narsinghpur district has received many natural gifts as Narmada Kachhar . In the Eighteenth Century Jat Sardars got constructed a large Temple, in which Idol of Lord Narsimha placed worshiped so in the name of Lord Narsimha the village. Gadariya Kheda become " Narsinghpur" later on it become headquarter of the district

Location:

Narsinghpur district is situated in the central part of Madhya Pradesh & Madhya Pradesh is located in the Central part of India. Latitude 22°.45 North 23°.15 North, longitude 78°.38 East 79°.38 East, Area 5125.55 sq Km, 359.8 meters above the sea.

Agriculture:

In Narsinghpur is a district, which is well known for its fertile land, it is said to be the most fertile land all over Asia. Black soil suited for any kind of cultivation blessed with adequate irrigation facilities. District is famous for its rich agricultural production. Being situated at upper part of Narmada Valley, which is much important for agriculture. District's production of grains is more

than the actual requirement. For agriculture both old and new techniques are equally in practice. In old equipments there are Ploughs, Bullock Carts, Bakhar, Hnasiya Various types of knives and khurpi etc. In new methods or techniques Thrashers, Tractors, Harvesters, electric pumps, sprinklers etc. Along with these better quality seeds and best quality pesticides are used

Crops:

Mainly crops are cultivated in two seasons namely Rabi and Kharif. This is based on the climate and the conditions prevails in the district by the time.

:-Rabi crop cultivated in Oct-Nov and cutting in April- May, major rabi crops are Wheat, Pulses, Peas, Alsi, Masoor etc.

:-Kharif farming period is June-July and cutting in Oct. Major Kharif crops are Paddy, Jowar, Bajara, Makka, Kondo Kutki etc.

Districts Major commercial crops are Soyabean and Sugarcane, which is produced in large quantity and major source of earning. Narsinghpur is the largest producer of Soya bean in the Madhya Pradesh. Soya bean is used for oil extraction and Sugarcane for sugar and Gur.

Soil:

District has got rich black soil which is most fertile and heavy and useful for farming. Black Domat soil, smooth soil, rocky soil, and sandy soils are there in which wheat, grams and all type of pulses has been mainly produced. Kalmatahar area of the district is one of the most fertile land of Asia. Here wheat and gulabi grams are the major crops which is produced in large quantity. Gadarwara is very famous for tuwar (Arhar) pulses mainly. At district level agricultural farms, soil experiment laboratories are there. where farmers get pesticides, best quality seeds, fertilizers and most important technical guidance.

Irrigation:

Major sources for irrigation are wells, ponds, rivers, canals and tubewells. Mainly irrigation has done by tubewells.

KRISHI UPAJ Narsinghpur, Gotegaon, Kareli, Gadarwada, Tendukheda

Forest Treasure:

In district 26.55% area is covered by the forests which is of mixed kind. It is of Herbs, Sherbs and scurbs. Hilly area of Satpura and Vindhyaachal there are trees of Teak, Saal, Bamboo, saj and in planes are full of Mahuwa, mangoes, khairi, Achar, Karonda, Harr, Baheda.

Teak forests found everywhere means it is very densely found all over the district. Dry wood from the forests is used in many domestic purposes and used for building construction and furniture making. In the District Tobacco leaves collection done in large scale. and season for tobacco collection is May-June. From Tobacco leaves usually Bidies were made. In rural areas private contractors do the mahuwa collection which is used for preparing local wine.

From the forests we get Amala, Chironji, Harr, Baheda, Gum and herbs which is used for medicinal purposes. District has got plenty of mango trees and having ample production. In the deep forests there are tigers, bears, monkeys, rabbits, pigs, deer, foxes, neelgay and panther

Minerals:
In the district Soap stone, dolomite, fireclay, limestone found excessively apart from this building constructions stone is also found near village Gontoriya. Fireclay found mainly in Kanharpani, Bachai, Heengpani and Hiranpur hills. From various hilly areas we found Murram, crashed stones and from rivers sand which is used for construction purpose. Cement manufactured from limestone, cement pipes are prepared from cement. In village Chichali metal called peetal combination of copper and zinc utensils prepared. Chichali is very famous for these items.

Industry:

Narsinghpur being an agricultural land huge industries are rare, also most of the industrial institutions are agricultural oriented. Industries

includes agricultural equipments, iron items and Tendukheda and Dangidhana is well known for these industries.

GUR/SUGAR FROM SUGARCANE:

In many places Gur has been prepared from sugarcane all over the district. Kareli is very famous for Gur Mandi. In Narsinghpur and Gadarwara there are sugar mills. **BEEDI INDUSTRY:**

This work mainly done in Narsinghpur, Gadarwara, Gotegaon.

DAAL MILLS:

Tuwar (arhar) pulses prepared mainly at Narsinghpur and Gadarwara.

OIL MILLS:

There are many oilmills in the district where Soya bean, Groundnut and Tili oil extracted.

Apart from the above mentioned there are so many industries which includes Cement pipes, paper mills, plastic and rubber industry, leather goods manufacturing, earthen utensils and pots, poultry farms, goats farming, fish farming are the other works which is also done in many places of the district.

Climate:

In the district climate is very pleasant except in summers. Except South West Monsoon rest of the year waves moves slowly. District's usual minimum temperature rests around 25-26 degree Celsius and maximum temperature rises upto 45-46 degree Celsius. May is the hottest month of the year. It is very excessive hot during summer and in the end of this season dustful storms come. When Monsoon reaches mercury goes very down. **District's 90% rainfall observed in monsoon months only i.e. June to September. An average rainfall is of 60 days and measuring approximately 40 inches.** During December-January it is very cold and average temperature during day time is around 9 degree Celsius. Sometimes cold waves also occurs and heavy fog also observed.

(Source- <https://narsinghpur.nic.in/en/about-district/>)

Objectives -

- Epidemiological studies to undertake prevention, control activity and public awareness in affected area.

Method-

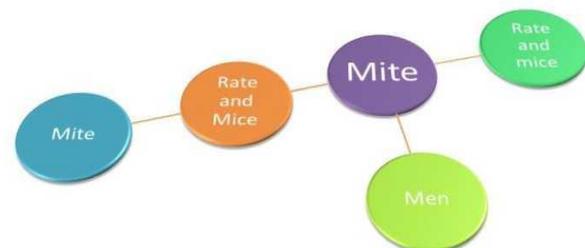
- The team interviewed suspected scrub typhus case patients / case, family members and other villager's.
 - Suspected scrub typhus fever/case survey for epidemiological study.
 - "Blood/ Serum sample" collected and send the laborites for the investigation.

Epidemiological -

(a) Agent - The causative agent of scrub typhus is Rickettsia tsutsugamushi. There are several serologically distinct strains.

(b) Reservoir - The true reservoir of infection is the trombiculid mite (Leptotrombidium delinense and L. akamushi). The infection is maintained in nature transovarially from one generation of mite to the next. The nymphal and adult stages of the mite are free living in the soil. They do not feed on vertebrate hosts. It is the larva (Chigger) that feed on vertebrate hosts and picks up the rickettsia. The larval stage serves both as reservoir, through ovarian transmission, and as a vector for infecting humans and rodents.

(c) Mode of Transmission- By the bite of infected larval mites.



Incubation period - Usually 10 to 12 days, varies from 6 to 21 days.

Clinical features - The onset is acute with chills and fever, Headache, malaise, prostration and a

macular rash appearing around the 5th day of illness. Generalized lymphadenopathy and lymphocytosis are common.

Control measures-

(a) Treatment-

- Use of doxycycline and tetracycline, or between tetracycline and chloramphenicol in the management of scrub typhus.

(a) Vector control-

- Clearing the vegetation where rats and mice live, application of insecticides such as lindane or chlordane to ground and vegetation.
- Rodent Control Rodent control is a multidimensional activity that requires multisectoral cooperation.
- Different control strategies such as trapping,

poisoning and use of natural predators are in practice.

- Rats and mice may be encouraged if weeds grow around buildings.

- Good sanitation in and around buildings

(b) Personal prophylaxis-

- Impregnating clothes and blankets with miticial chemicals (benzyl benzoate) and application of mite repellents (diethyltoluamide) to exposed skin surfaces.
- Health Education Health education of the people regarding the modes of transmission, personal prophylaxis, prevention of the disease

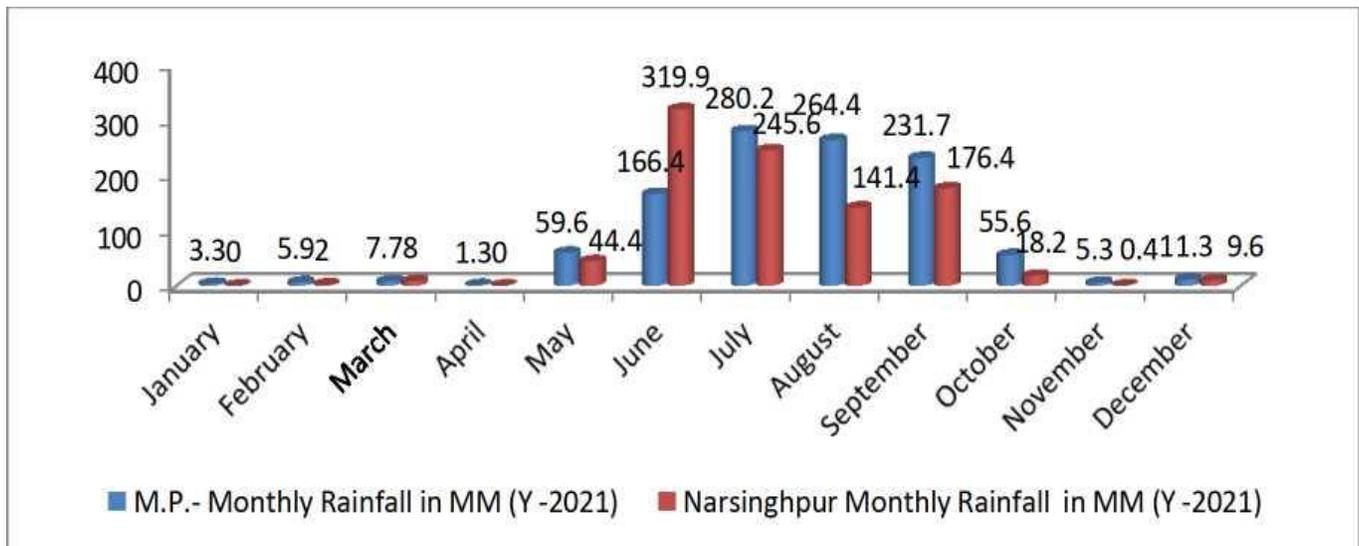
(c) No vaccine exists at present.

Data analysis-

1- Monthly rainfall data analysis- The data is displaying in state Madhya Pradesh and district Narsinghpur maximum rainfall in June to September in every year.

Place	January	February	March	April	May	June	July	August	Septembe	October	November	December
M.P.- Monthly Rainfall in MM (Y - 2021)	3.3	5.9	7.7	1.3	59.6	166.4	280	264	232	56	5.3	11
Narsinghpur Monthly Rainfall in MM (Y - 2021)	0	2	8	0	44.4	319.9	246	141	176	18	0.4	9.6

(Table No.-1- state and district wise rainfall)

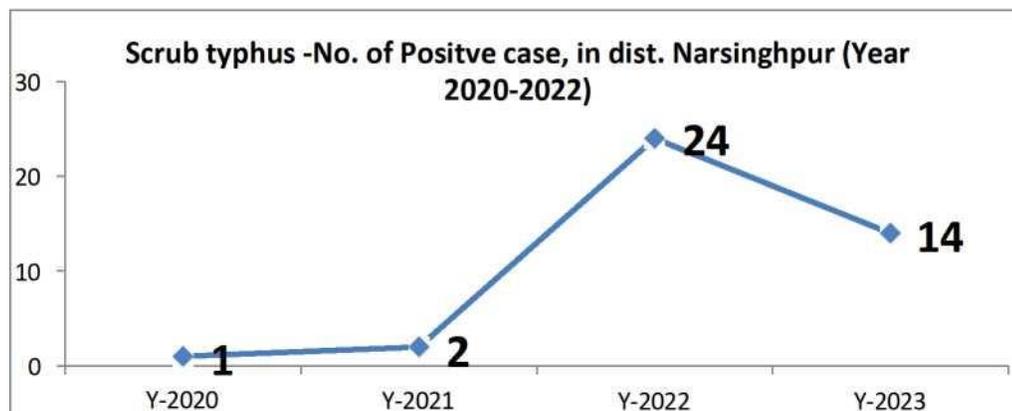


(Graph No.-1- state and district wise rainfall)

2- Year wise positive case data analysis- The data is displaying in case are increasing in Year 2020 to Year 2022 and decreasing the case in year 2023 in the district Narsinghpur.

Year	Scrub typhus -No. of Positive case, in dist. Narsinghpur (Year 2020-2022)
Y-2020	1
Y-2021	2
Y-2022	24
Y-2023	14
	41

(Table No.-2- Year wise positive case)

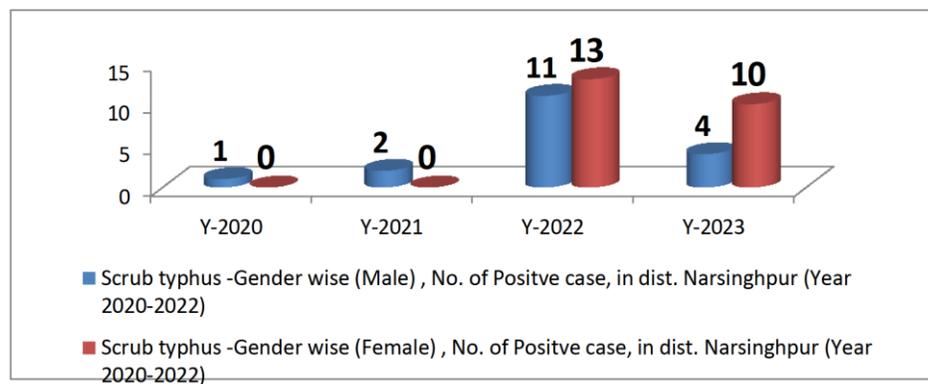


(Graph No.-2- Year wise positive case)

3- Year and gender wise positive case data analysis- The data is displaying year wise female case are increasing / female are more affected compression the male in the district Narsinghpur.

Year	Scrub typhus -Gender wise (Male) , No. of Positive case, in dist. Narsinghpur (Year 2020-2022)	Scrub typhus -Gender wise (Female) , No. of Positive case, in dist. Narsinghpur (Year 2020-2022)
Y-2020	1	0
Y-2021	2	0
Y-2022	11	13
Y-2023	4	10
	18	23

(Table No.-3- Year and gender wise)

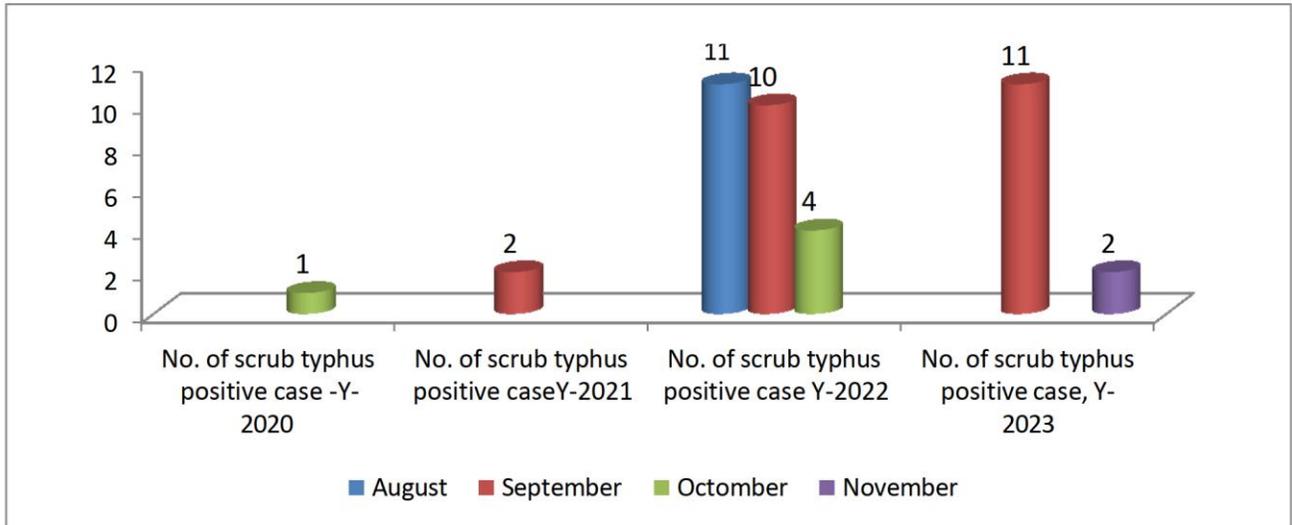


(Graph No.-3- Year and gender wise)

4- Year and month wise positive case data analysis- The data is displaying year - 2022 affected the maximum case and month September year 2021 -20222 affected the maximum case found in the affected area district Narsinghpur.

Months	No. of scrub typhus positive case -Y-2020	No. of scrub typhus positive caseY-2021	No. of scrub typhus positive case Y-2022	No. of scrub typhus positive case, Y-2023
August			11	
September		2	10	11
October	1		4	
November				2
	1	2	25	13

(Table No.-4- Year and month wise)

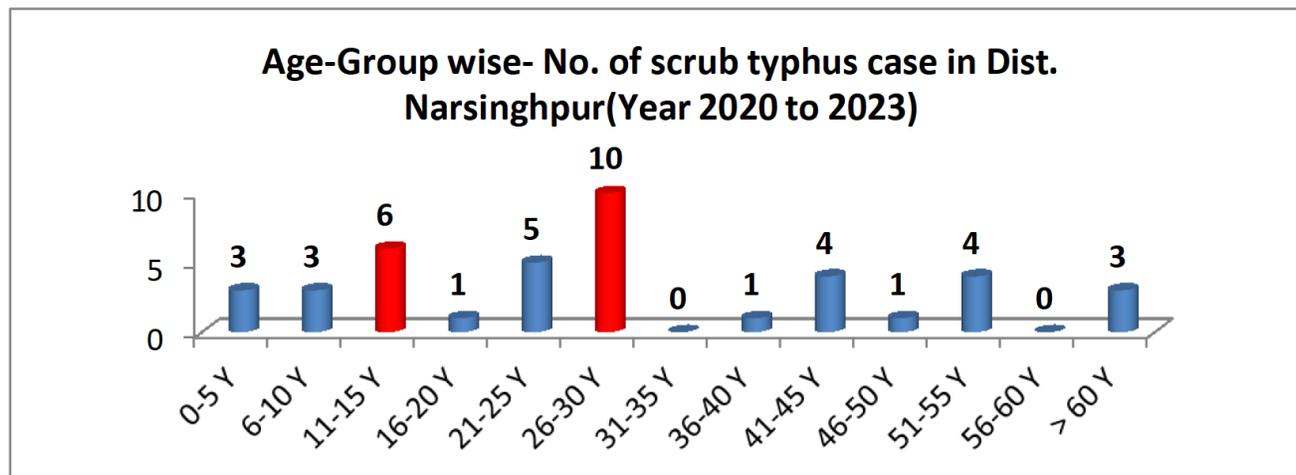


(Graph No.-4- Year and month wise)

5- Age group wise positive case data analysis- The data is displaying that age group 26-30 year- age group maximum 10 case and Age group 11-15 year- 6 case positive found in the affected area district Narsinghpur.

Age Group	Age-Group wise- No. of scrub typhus case in Dist. Narsinghpur (Year 2020 to 2023)
0-5 Y	3
6-10 Y	3
11-15 Y	6
16-20 Y	1
21-25 Y	5
26-30 Y	10
31-35 Y	0
36-40 Y	1
41-45 Y	4
46-50 Y	1
51-55 Y	4
56-60 Y	0
> 60 Y	3

(Table No.-4- Age group wise)

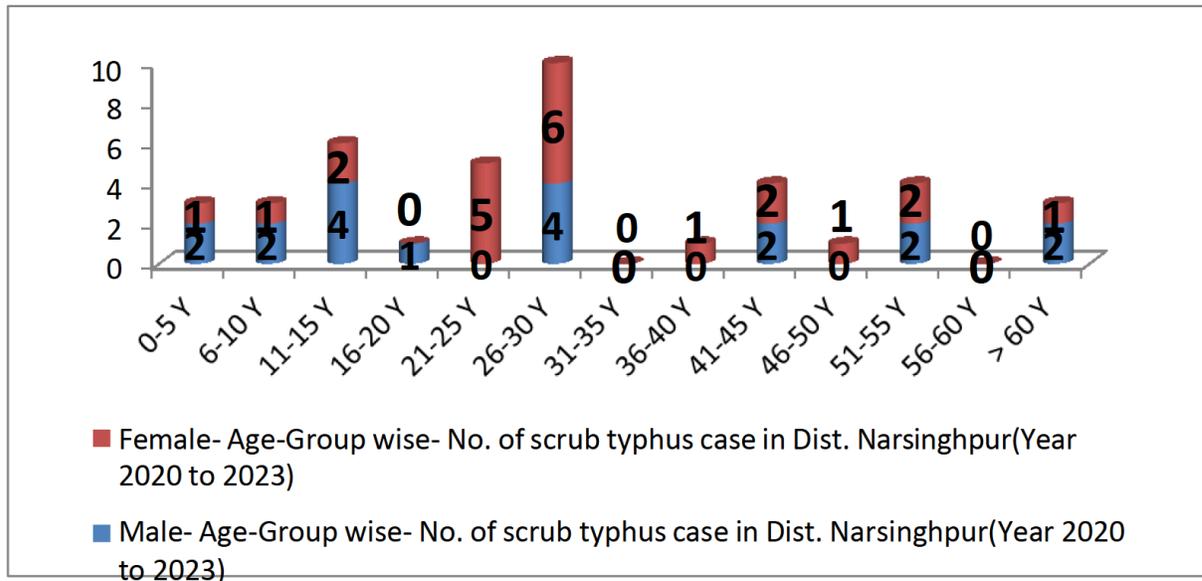


(Graph No.-5- Age group wise)

6- Age group and gender wise positive case data analysis- The data is displaying that age group 0-5 year, 6-10 year, 11-15 year - age group maximum male affected/positive and Age group 21-25 year, 26-30 year- maximum female affected/ positive found in the affected area district Narsinghpur.

Age Group	Male- Age-Group wise- No. of scrub typhus case in Dist. Narsinghpur (Year 2020 to 2023)	Female- Age-Group wise- No. of scrub typhus case in Dist. Narsinghpur (Year 2020 to 2023)
0-5 Y	2	1
6-10 Y	2	1
11-15 Y	4	2
16-20 Y	1	0
21-25 Y	0	5
26-30 Y	4	6
31-35 Y	0	0
36-40 Y	0	1
41-45 Y	2	2
46-50 Y	0	1
51-55 Y	2	2
56-60 Y	0	0
> 60 Y	2	1

(Table No.-6- Age group and gender wise)

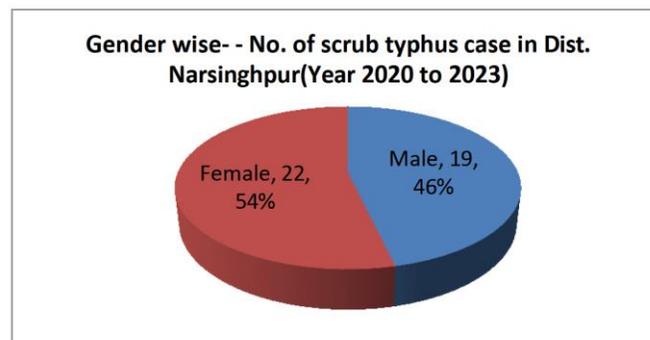


(Graph No.-6- Age group and gender wise)

7- Gender wise positive case data analysis- The data is displaying that female are more affected compare the male in the affected area district Narsinghpur.

Gender	Gender wise - No. of scrub typhus case in Dist. Narsinghpur(Year 2020 to 2023)
Male	19
Female	22
	41

(Table No.-7- Gender wise)

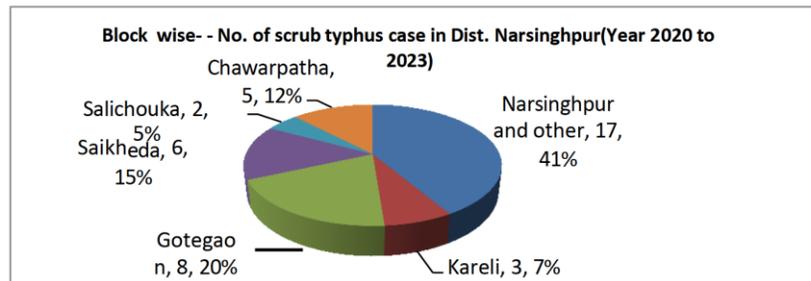


(Graph No.-7- Gender wise)

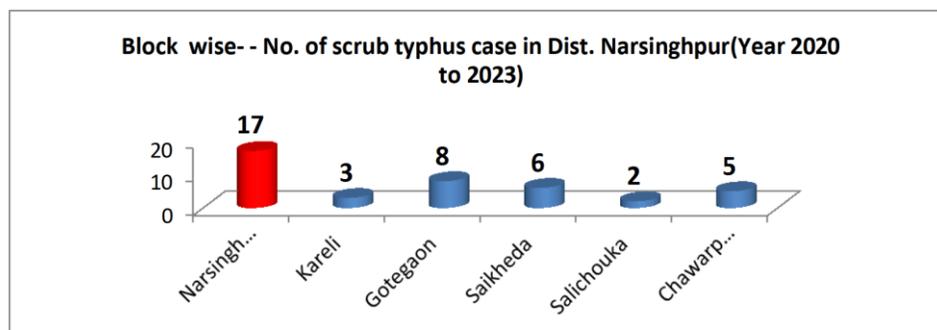
8- Block wise positive case data analysis- The data is displaying that block Narsinghpur (other) -17 case maximum, Gotegaon- 8 case, Saikheda- 6 case has affected/positive found in the affected area district Narsinghpur.

Block	Block wise- - No. of scrub typhus case in Dist. Narsinghpur(Year 2020 to 2023)
Narsinghpur and other	17
Kareli	3
Gotegaon	8
Saikheda	6
Salichouka	2
Chawarpatha	5
	41

(Table No.-7- block wise)



(Graph No.-7(1)- Block wise)



(Graph No.-7(2)- Block wise)

Conclusion- Scrub typhus spreads in the Narsinghpur. Most infectious outbreaks are seen in Dist. Narsinghpur, Madhya Pradesh. Scrub typhus is accompanied by high morbidity. Patients who present with fever during the monsoon season require a heightened index of suspicion. Higher disease risk is primarily seen in agriculture workers/farmer/ specially female and high risk group. IgM ELISA test helps in the diagnosis to the disease. This review highlights the prompt diagnosis, treatment and management of scrub typhus.

Suggestion- · Store the grain/food in properly safe area/ safe the rodent. · Before Sleeping bed clean daily and food/grain keep in the separate store rooms. · Farmer's using the proper clothes/shoes/gloves which will safety for the rodent- tick. · Keep the distance from wild animal known to carry typhus, like rats, flying squirrels and Opossums. Don't leave food waste or other trash in your yard where it could attract them. · Basic hygiene helps. This includes very simple things like bathing at least daily, changing/washing your clothes on a regular basis · Spray pest control in your yard and don't let your pets share your bed. · Don't travel scrub typhus spread/affected area.

References-

- 1- <https://www.cdc.gov/typhus/scrub/index.html>
- 2- PARK K., park's textbook of preventive and social medicine, 27 Edition, Feb. 2023, Jabalpur-1167, Premnagar, Jabalpur, M.P. (Pg. no.-347)
- 3- IDSP DISEASE OUTBREAK INVESTIGATION MANUAL- State Surveillance Unit, Integrated Disease Surveillance Programme (IDSP), Directorate of Health Services Madhya

Pradesh-2023 Page No. 66

- 4- (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9641991/>)
- 5- <https://narsinghpur.nic.in/en/about-district/>
- 6- <https://www.cdc.gov/typhus/scrub/index.html#:~:text=Scrub%20typhus%2C%20also%20known%20as,body%20aches%2C%20and%20sometimes%20rash.>
- 7- Updated by Zoonosis Division NCDC on 2.07.2019
- 8- ICMR-Jabalpur lab report.