

# Clinico-Epidemiological Study of Bovine Tumours

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## ABSTRACT

The present study was conducted to determine the clinico-epidemiological surveillance of bovine tumours during the period 2020-2023 based on total 11947 bovine cases registered at Veterinary Clinical Complex of the College at Junagadh (India). Among them, 3,597 (30.11%) cases had suffered with different surgical ailments and 251 cases (2.10%) were diagnosed as tumours. The highest incidence was recorded in the age group of 6 to 10 years (53.78%), followed by 11 to 15 years (27.1%), 0 to 5 years (14.34%), 16 to 20 years (4.38%) and more than 21 years (0.4%). Cases of neoplasms were observed more in females (59.36%) than in males (40.64%). Breed-wise distribution showed a higher incidence of neoplasms in Gir cattle (35.05%), followed by Kankrej cattle (27.1%), Jaffrabadi buffalo (20.32%), non-descript cattle (11.55%), non-descript buffalo (3.58%) and lowest in Holstein Friesian cattle (2.39%). The highest incidence of tumours was observed in horns (53.78 %) followed by neck (7.97%), eyes (7.57%), head region (7.57%), genitalia (7.17%), udder (5.58%), limb (4.78%), abdomen region (3.98%) and nasal cavity (1.6%).

**Keywords:** Age, Breed, Bovine, Epidemiology, Sex, Tumours.

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## INTRODUCTION

In normal eukaryotic organisms, tissues achieve growth equilibrium, defined as the point at which the production of new cells equals the death rate of cells so that there is no net gain of tissue. However, in the case of tumours, cell replication surpasses normal physiologic needs (Kitchell and Dervis, 2010). Bovine neoplasms produce high economic losses to dairy farmers by impairing their animal's production, reproduction and working ability. The incidence of bovine tumours is increasing due to various factors such as exposure to carcinogens, pigmentation, irradiation, hereditary factors and irrational use of pesticides and hormones (Dubielzig, 2002). The treatment of neoplasms can be categorized as either curative or palliative, although a variable percentage of patients can be cured. Retrospective clinical-epidemiological studies of bovine tumours play a valuable role in enhancing treatment protocols by identifying risk factors associated with neoplasia and establishing prognostic indicators. The present study was aimed to know retrospectively the incidence of tumours in bovine as influenced by major clinico-epidemiological factors.

## MATERIALS AND METHODS

The present retrospective study was carried out based on 11,947 bovines presented at the Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Kamdhenu University, Junagadh, Gujarat, India during the period of three years (April 2020 - March 2023). Out of these cases, 3,597 (30.11%) cases had different surgical ailments, of which 251 cases (2.10%) were diagnosed as tumour cases. Out of confirmed cases of bovine tumours, data regarding age

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(0-5, 6-10, 11-15, 16-20 and >21 years), sex (male and female), breed (Gir, Kankrej, HF & non-descript cattle; Jaffarabadi and non-descript buffalo) and site (horns, eyes, nasal cavity, head region, neck, abdomen, limbs, udder and genitalia) of occurrence of tumours were recorded and analysed for their frequency.

## RESULTS AND DISCUSSION

### Age-wise Incidence

During this study, the highest incidence of bovine tumours was recorded in the age group of 6 to 10 years (53.78%), followed by 11 to 15 years (27.1%), 0 to 5 years (14.34%), 16 to 20 years (4.38%) and more than 21 years (0.4%) (Table 1).

**Table 1:** Age-wise distribution of tumour affected animals (n=251)

Age group	No. of cases	Percentage
0-5 years	36	14.34%
6-10 years	135	53.78%
11-15 years	68	27.10%
16-20years	11	4.38%
> 21 years	1	0.4%

The increased frequency of cases observed within the age group of 6-10 and 11-15 years may be attributed to the requirement of an extended period for tumour development and progression, as well as the need for prolonged exposure to carcinogens for efficient mutagenesis. Additionally, ageing tissue is more susceptible to neoplastic transformations compared to juvenile tissue, which could explain the higher susceptibility to tumours in older individuals (Arya *et al.* 2018). Similarly, Naik (2010) observed a higher incidence of neoplasms in cattle aged between 6 to 9 years (44.06%), while, Joshi *et al.* (2009) observed the highest incidence in the age group of 7 to 10 years (72.22%), followed by 10-12 years (16.66%) and lowest in 5-6 years (11.11 %).

**Sex-wise Incidence**

In the present study, cases of neoplasms were observed more in females (59.36%) and less in males (40.64%). This could be due to the fact that farmers rear a larger number of females for production purposes, as they serve as a source of income. Consequently, farmers pay more attention to the health and treatment of female animals (Arya *et al.*, 2018). Kimura *et al.* (2012) found that a higher proportion of female

bovines (47%) exhibited neoplasms compared to males (20%). However, Ozsoy *et al.* (2011) observed a higher incidence of neoplasms in males (54.9%) and less in females (45.1%) among 82 recorded cases.

**Breed-wise Incidence**

The breed-wise distribution showed a higher incidence of neoplasms in Gir cattle (35.05%), followed by Kankrej cattle (27.1%), Jaffrabadi buffalo (20.32%), non-descript cattle (11.55%), non-descript buffalo (3.58%) and lowest in Holstein Friesian cattle (2.39 %) (Table 2).

**Table 2:** Breed-wise distribution of tumour affected animals (n=251)

Breed	No. of animals	Percentage
Gir cattle	88	35.05%
Kankrej cattle	68	27.10%
Jaffrabadi buffalo	51	20.32%
Non-descript cattle	29	11.55%
Non-descript buffalo	9	3.58%
Holstein Friesian	6	2.39%

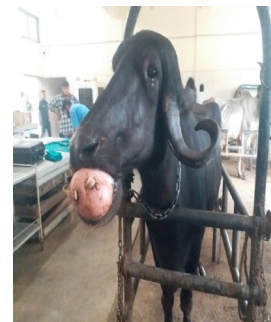
Jaffrabadi buffalo and Gir cattle are native breeds of the Saurashtra region, while the Kankrej bullock has been extensively used for various agricultural activities in the same region. These factors suggest that the occurrence of tumours may be relatively higher in these three breeds. Joshi *et al.* (2009) observed a higher incidence of horn cancer in the Kankrej breed of cattle, which was attributed to the presence of big and massive horns with a genetic predisposition.



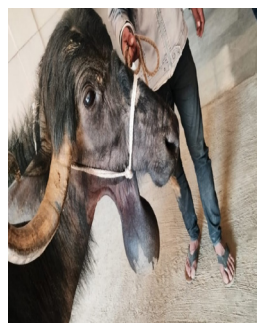
Horn cancer in a cow



Eye cancer in a bullock



Odontoma in a buffalo



Tumour at head region in a buffalo



Tumour at limb in a buffalo



Udder tumour in a buffalo

**Fig. 1:** Different types of bovine tumours



Degloorkar *et al.* (1992) observed the highest incidence of tumours in cattle (87.95%) than in buffaloes (2.82%).

### Site of Occurrence

The details regarding site of occurrence of tumours have been presented in Table 3. Based on observations, the highest incidence of tumours was observed in horns (53.78 %) followed by neck (7.97%), eyes (7.57%), head region (7.57 %), genitalia (7.17%), udder (5.58%), limbs (4.78%), abdomen region (3.98%) and nasal cavity (1.6%) (Fig. 1).

**Table 3:** Site of occurrence of bovine tumours (n=251)

Site of occurrence	No. of cases	Percentage
Horn	135	53.78
Neck	20	7.97
Eye	19	7.57
Head	19	7.57
Genitalia	18	7.17
Udder	14	5.58
Limb	12	4.78
Abdomen region	10	3.98
Nasal cavity	4	1.60

The occurrence of tumours at different body sites may be due to the anatomical structure of that part which may be more prone to continuous friction, work, carcinogens etc. Various scientists ( Gulbahar, *et al.* 2002; Sreenu *et al.* ,2003; Manjunath *et al.*, 2007; Kohli and Mashadi, 2008) observed tumours at various site in bovines.

The study concluded that the bovines between 6 to 10 years of age group were mostly affected by tumours. Among breeds, Gir cattle was found more affected followed by Kankrej cattle, Jaffrabadi buffalo, non-descript cattle/buffalo and the lowest in HF cattle in Junagadh region. The highest incidence of tumours was observed in horns, followed by neck, eyes, head region, genitalia, udder, limb, abdominal region and nasal cavity.

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