The Pharma Innovation Journal 2023; 12(3): 4208-4212

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(3): 4208-4212
© 2023 TPI
www.thepharmajournal.com
Received: 15-12-2022
Accepted: 19-01-2023

JK Mahla
Assistant Professor, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

PV Parikh
Professor and Head, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

AR Mecvan
Assistant Professor, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

PB Dabhi
Senior Research Associate, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

NR Amin
Teaching Associate, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

AK Patel
PG Scholar, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

MN Gelat
PG Scholar, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

Corresponding Author:
JK Mahla
Assistant Professor, Department of Veterinary Surgery and Radiology, College of Veterinary Sci. & A.H., Kamdhenu University, Anand, Gujarat, India

Studies on prevalence of bad conformation and lameness in horses of Gujarat

JK Mahla, PV Parikh, AR Mecvan, PB Dabhi, NR Amin, AK Patel and MN Gelat

Abstract
A randomly selected horses (n=1008), which includes (51.69%, 521) males and females (48.31%, 487) belonged to different zones of Gujarat were surveyed for prevalence of lameness and bad conformation during year 2019 to 2021. The overall incidence of lameness was recorded 19.25% whereas 26.69% bad conformation, where affections were recorded higher 22.26% in males then 16.08% in females. The flooring based incidence of bad conformation and lameness were recorded more 31.63% and 29.50% respectively in the Pakka floor as compared to incidence of 21.04% bad conformation and 12.15% lameness in the horses, those were maintained on Kachcha floor. The hoof trimming practice was regularly adopted in 75.60% horses and was being shoed regularly, where the lowest shoeing interval of 15 days was recorded in hand made rubber shoe for carting horses. The ceremonial dance horses had highest incidence of bad conformations (36.93%) and lameness (31.82%), where hindlimb walk and dance on wooden charpai with rider on back were routine for dance horses of Gujarat. Overgrown hooves (23.21%) were recorded the highest amongst all other incidence of bad conformations, while incidence of canker (3.57%) was recorded the highest in the incidence of lameness. Out of total 19.25% overall lameness; 81.96% lameness was located at lower limbs. Amongst forelimb lameness 90.74% were recorded at lower limb, while 70.93% lower limb lameness was recorded in hindlimb. Higher incidence of lower hindlimb lameness (70.93%) was attributed to ceremonial dance and hindlimb walk with rider on back.

Keywords: Bad conformation, lameness, canker, laminitis

1. Introduction
Horses in India are precious animals for prestige, social traditions, sports, patrolling and transportation, where bad conformation and lameness cause considerable impact on economy of livestock industry, but there exists a paucity of information on the prevalence rate of bad conformation and lameness in Gujarat as well as in India. The present study was, therefore undertaken to understand the extent of equine bad conformation and lameness.

2. Materials & Method
The present surveillance was made by farm visits and horses presented for treatment at Surgery Department, Veterinary College, Anand to find out existence of bad conformation and lameness in the horses of Gujarat. The feeding practice, flooring pattern, purpose of rearing, hoof trimming and shoeing practice with intervals were correlated with existence of bad conformation and lameness in the horses of Gujarat. During surveillance, a randomly selected horses (n=1008) belonged to different zones of Gujarat were examined, which includes (51.69%, 521) males and females (48.31%, 487) during year 2019-21.

3. Results & Discussion
The overall incidence of lameness (19.25%, 194) and bad conformation (26.69%, 269) was recorded in the horses of Gujarat. The present finding of lameness incidence was lesser than (23.10%, 84) incidence of lameness was reported by Naeini and Niak (2005) [2].

3.1 Breed & Sex wise incidence
The incidence of bad conformation was recorded highest in the Nondescript horses (31.60%), followed by Sindhi Cross (30.21%), Kathiyawadi (29.60%), Thoroughbred (25.93%), Sindhi (23.53%) and Marwadi horses (22.42%), whereas lameness incidence was recorded the highest in the Sindhi Cross horses (23.96%), followed by Nondescript (23.47%), Sindhi (21.57%),

Kathiyawadi (18.39%), Marwadi (18.30%) and Thoroughbred horses (7.41%). The present higher incidence of bad conformation in the Nondescript, Sindhi Cross and Kathiyawadi horses were might be due to their utilization for ceremonial dance and hindlimb walk with rider on back.

Table 1: Breed and sex wise incidence

Breed	Sex	Surveyed population (n)		Bad conformation				Lameness			
				N		Percent (%)		N		Percent (%)	
Marwadi	Male	207	388	48	87	23.19	22.42	46	71	22.22	18.30
	Female	181		39		21.55		25		13.81	
Kathiyawadi	Male	188	348	54	103	28.72	29.60	29	64	15.42	18.39
	Female	160		49		30.63		35		21.86	
Sindhi	Male	23	51	7	12	30.43	23.53	4	11	17.39	21.57
	Female	28		5		17.86		7		25.00	
Sindhi Cross	Male	41	96	13	29	31.71	30.21	16	23	39.02	23.96
	Female	55		16		29.09		7		12.73	
Nondescript	Male	50	98	17	31	34.00	31.63	14	23	28.00	23.47
	Female	48		14		29.17		9		18.75	
Thorough	Male	12	27	3	7	25.00	25.93	1	2	8.33	7.41
	Female	15		4		26.67		1		6.67	
Total	Male	521	1008	142	269	27.26	26.69	116	194	22.26	19.25
	Female	487		127		26.08		78		16.08	

Sexwise incidence showed higher incidence of lameness 22.26% in males then 16.08% females (chart 1), which might be due to males were preferred for ceremonial utilities, ridding/ racing and patrolling purpose, which could be reflected as more lameness incidence in males than female horses. The present findings of high lameness incidence in the males were unmatched with findings reported by Mistry *et al*. (2012) [3], where they found lameness incidence higher in females (81.25%) than in males (18.75%).

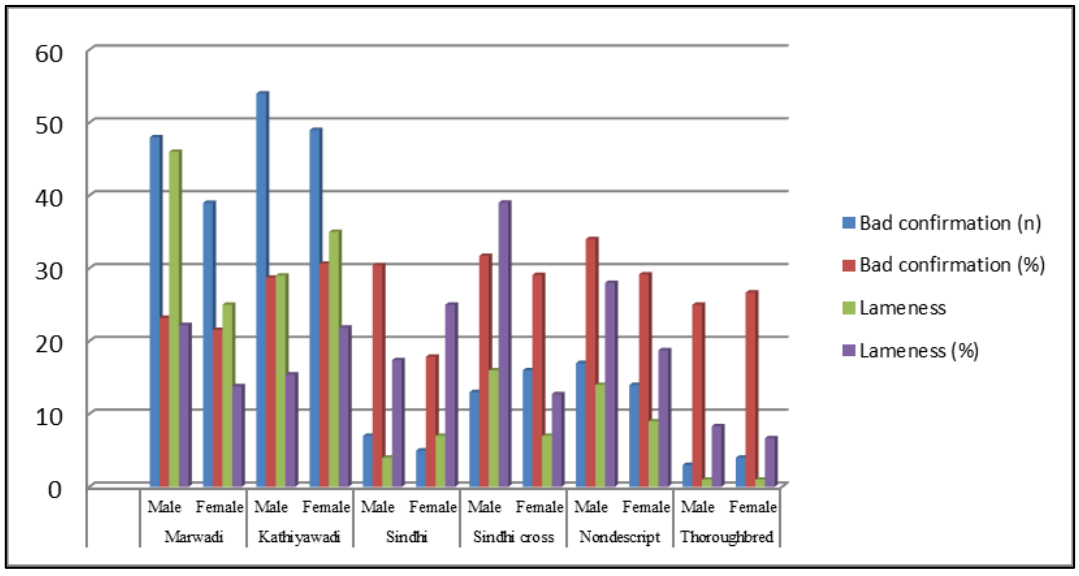

Chart 1: Sexwise incidence of lameness and bad conformation

3.2 Agewise incidence

The present study was carried out based on age groups; where the lowest incidence of bad conformation was observed in <2 years age group (10.77%; 7/65), while age group 2 to 10 years horses showed the highest (30.28%; 165/545), whereas >10 years age group horses had (24.37%; 97/398) incidence of bad conformation. The incidence of lameness was recorded less (7.69%; 5/65) in the <2 years horses, while adult horses age group (2 to10 years) showed (18.72%; 102/545) lameness and the highest lameness conditions were recorded in the horses belonged to age group >10 years (21.86%; 87/398). The present findings were unmatched with finding made by Mistry *et al*. (2012) [3]; they observed the highest (33.52%; 59) lameness incidence in the young horses (< 2years) as compared to other age groups.

3.3 Flooring based incidence

The present survey was also carried out based on flooring patterns of horses and efforts have been made to find out incidence of lameness and bad conformation on different flooring offered to horses. *Pakka* floor was adopted more (54.27%; 547/1008), as compared to *Kachcha* floor (45.73%; 461/1008) for housing of horses in Gujarat. The incidence of bad conformation and lameness were recorded more (31.63%; 173/547) and (29.50%; 136/547) respectively in the *Pakka* floor as compared to incidence of bad conformation (21.04%; 97/461) and lameness (12.15%; 56/461) in the horses, those were maintained on *Kachcha* floor.

Kachcha flooring with proper hygiene was adopted more by modern horse keepers and found incidence of bad conformation (14.56%; 23/158) and lameness (8.23%;

13/158), whereas in the other hand traditional horse keepers with limited income peoples were also reared horses on *Kachcha* floor with poor hygiene and uneven surface with incidence of bad conformation (24.42%; 74/303) and lameness (14.19%; 43/303). The present study showed less incidence of bad conformation and lameness was recorded on *Kachcha* ground floor might be due to its soft and pliable nature; however we could not found similar reports from other author during present study.

3.4 Purpose of horse keeping based incidence

The horse population of Gujarat was surveyed based on their purpose of rearing and found the highest purpose of rearing was patrolling and gaming (28.77%; 290/1008), followed by horse carting (*Baggi*) purpose (23.31%; 235/1008), ceremonial dancing purpose (17.46%; 176/1008), race horse/ridding purpose (15.77%; 159/1008) and breeding/hobby purpose (14.68%; 148/1008).

The incidence of bad conformation was observed the highest in the ceremonial dance horses (36.93%; 65/176), followed by horse carting horses (32.34%; 76/235), patrolling purpose police horses (22.41%; 65/290), breeding purpose (20.95%; 31/148) and race/ ridding horses (20.13%; 32/159) with an overall mean percent 26.55±3.40, similarly the incidence of lameness was recorded the highest (31.82%; 56/176) in the ceremonial dance purpose horses, followed by horse carting (*Baggi*) horses (22.98%; 54/235), ridding horses (14.47%; 23/159) and breeding horses (11.49%; 17/148) with an overall mean percent 19.19±3.69. The present finding of high incidence of bad conformation and lameness in the ceremonial dance purpose horses were might be due to hindlimb walk with rider on back and dancing on ground/ charpai; however we could not found similar report from other authors during the present study.

3.5 Hoof trimming interval based prevalence of bad conformation and lameness

Hoof trimming practice was varied from 15 days to 8 months; observed in the present lameness survey in horses of Gujarat. The hoof trimming practice was regularly adopted in the horses (75.60%; 762/1008) and were being shoed regularly, while remaining horses (24.40%; 246/1008) were remained un-shoed for entire life and hoof trimming was irregularly carried out based on their unavoidable requirement (up to 8 months).

The lowest incidences of bad conformation (20.12%; 69/343) and lameness (17.49%; 60/343) were observed in the horses with up to 1 month hoof trimming interval. Hoof trimming interval 1 to 2 months had slightly higher incidences of bad conformation (20.29%; 28/138) and lameness (19.57%; 27/138), similarly hoof trimming interval 2 to 3 months showed slightly higher incidence than the previous group (Table 2), while >4 months of hoof trimming interval showed the highest incidence of bad conformation (34.69%; 34/98) and lameness (33.67%; 33/98). Present study showed the lowest shoeing interval of 15 days in the horse carting horses were might be due to own made rubber shoe from used tyres of vehicle; which can provide better griping while walking or running on road, but on the other hand rubber material had more wear and tear, hence it was replaced within 15 days of interval, while the lowest incidence of bad conformation and lameness was recorded in the regular monthly hoof trimming; where it helped to maintain normal weight bearing and provides early detection of hoof problems if any, which helped to reduced incidence of bad conformation and subsequent lameness; however we could not found similar records from other authors during the present study.

Table 2: Hoof trimming interval based prevalence of bad conformation and lameness

Hoof trimming intervals	Horse population (n)	Bad conformation		Lameness	
		N	%	N	%
Up to 1 month	343	69	20.12	60	17.49
1-2 months	138	28	20.29	27	19.57
2-3 months	281	61	21.71	57	20.28
3-4 months	148	49	33.11	45	30.41
> 4 months	98	33	33.67	34	34.69
Mean ± SE	-	-	25.78±3.12	-	24.48±3.39

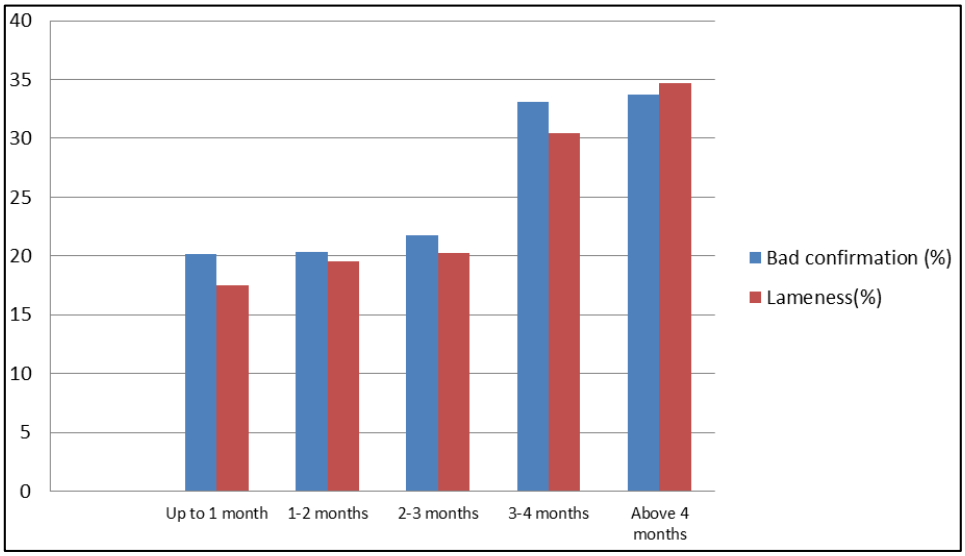

Chart 2: Hoof trimming interval based prevalence of bad conformation and lameness

3.6 Incidence of various bad conformations

A various 16 types of bad conformation were observed in the bad conformation horses (n=269) in the present surveillance and efforts have been made to find out prevalence of incidence of bad conformation; where each bad conformation affected horse had one or several bad conformations.

The over grown hooves were recorded the highest (23.21%; 234/1008) type of bad conformation amongst all followed in descending order by abnormal angles (16.47%; 166/1008), toe out (11.81%; 119/1008) seedy toe (9.23%; 93/1008), base wide (7.44%; 75/1008), sand crack (6.05%; 61/1008), olecrenon bursitis (5.26%; 53/1008), toe in (4.96%; 50/1008), wind puff (4.07%; 41/1008), bowed tendon (3.37%; 34/1008), base narrow (3.27%; 33/1008), hoof crack (2.68%; 27/1008), calf knee (0.79%; 8/1008), bench knee (0.69%; 7/1008), knock knee (0.60%; 6/1008) and buck knee (0.40%; 4/1008) were observed in the horse population of Gujarat. The similar findings were reported by few authors with limited types of bad conformation *viz*... Vadaliya *et al.* (2011) [4]; where they reported the highest incidence of over grown hooves (24%), followed by laminitic ring (20%), hoof wall crack (20%), and bar (4%).

The bad conformation affected horse population was found higher in the Nondescript horses (31.63%; 31/98), followed by Sindhi Cross (30.21%; 29/96), Kathiyawadi (29.60%; 103/348), Thoroughbred (25.93%; 7/27), Sindhi (23.53%; 12/31) and Marwadi (22.42%; 87/388). The present finding of higher bad conformation incidence in the Nondescript horses were might be due to its only purpose of rearing in villages was ceremonial dance and hobby purpose and most of them were irregular hoof trimmers, which attributes higher incidence of bad conformation; however we could not found similar reports from other authors.

3.7 Incidence of various types of lameness

The horses of Gujarat were surveyed randomly and found overall incidence of lameness (19.25%; 194/1008) in the present study; which comprised of 16 different types of lameness conditions, where incidence of canker was reported the highest (3.57%; 36/1008), followed by thrush (3.08%; 31/1008), tenosynovitis (1.98%; 20/1008), laminitis (1.88%; 19/1008), arthritis (1.59%; 16/1008), quittor (1.39%; 14/1008), spavin and ringbone (0.89%; 9/1008) each, side bone, buttress foot and Equine protozoan meningitis (0.79%; 8/1008) each, navicular disease (0.5%; 5/1008), subluxation of patella, splint and myositis (0.30%; 3/1008) each and congenital anomalies (0.2%; 2/1008).

The present findings of lameness incidence were unmatched with other records; however few records were available limited types of lameness incidnce *viz*… Dabareiner *et al.* (2005) [1] found highest incidence of forelimb foot pain only (39, 33%) followed by osteoarthritis of the distal tarsal joints (17, 14%), suspensory ligament desmitis (15, 13%), forelimb foot pain with distal tarsal joint osteoarthritis (11, 9%), and bruised feet (10, 8.5%). Vadaliya *et al.* (2011) [4] reported the incidence of lameness affections in equines as; laminitis (16%), thrush (12%) and buttress foot (4%).

The incidence of lower limb lameness was recorded (81.96%; 159/194) whereas only (18.04%; 35/194) lameness was observed above knee and hock joint in the present study. Forelimb lameness (55.67%; 108/194) was recorded in the present study; out of these lower limb affections (90.74%; 98/108), whereas only (9.26%; 10/108) lameness affections were located at knee joint and above. The prevalence of hindlimb lameness affections (44.32%; 86/194) were recorded; where the lower limb affections were recorded (70.93%; 61/86) and remaining (29.06%; 25/86) lameness affections were belonged to hock joint or above. The present findings of forelimb lameness was supported by findings made by Stashak (2011_a) [5]; where they reported incidence of lameness in forelimb was above 75.00 percent and out of that more than 90 percent lameness incidence was belonged to lower limb. Present study showed lower limb lameness (70.93%; 61/86), while hock joint and above (29.06%; 25/86) lameness were recorded in the horses, these findings were not supported by the findings made by Stashak (2011_b) [6]; where they reported incidence of lameness at hock and stifle was more than 80.00 percent, while present study showed lower hindlimb lameness (70.93%; 61/86) which might be due to ceremonial dance and hindlimb walk with rider on back.

3.8 Limb involvement in the bad conformation and lameness

In the present study, lameness conditions and bad conformations of horses were recorded as per limb involvement, the incidence of lameness and bad conformations of forelimb were recorded more in the left limb (16.41%; 76/463) than right (14.04%; 65/463), while bilateral (11.02%; 51/463) forelimb affections were recorded in the horses.

The incidence of hindlimb lameness in horses were observed more (18.36%; 85/463) in the right, than the left hindlimb (14.69%; 68/463), while bilateral hindlimb (10.15%; 47/463) involvement was observed in the surveyed horses (Table 3). The present findings were matched with findings made by Mistry *et al.* (2012) [3]; they reported incidences lameness based on limb involvement was higher in right hindlimb (18.18%) followed by left hindlimb (17.61%), left forelimb (15.90%) and right fore (14.20%). While Dabareiner *et al.* (2005) [1] reported more musculoskeletal lameness incidences associated with left hindlimb (31, 26%) than right hindlimb (25, 21%) in 118 racing horses.

Table 3: Limb involvement in the lameness and bad conformation

Body part	Forelimb			Hindlimb			All four limbs
	Left	Right	Bilateral	Left	Right	Bilateral	
Lameness & bad conformations	76	65	51	68	85	47	71
Percent (%)	16.41	14.04	11.02	14.69	18.36	10.15	15.33

4. Conclusions

- Male horses had higher incidence of bad conformation and lameness than females.
- Incidence of bad conformation and lameness was recorded more in the *Pakka* floor than in *Kachcha* floor.
- The soft and pliable *Kachha* flooring with proper hygiene was adopted more by modern horse keepers and found lowest incidence of bad conformation and lameness, whereas in the other hand traditional horse keepers with limited income peoples were also reared horses on

uneven ground surface and poor hygienic *Kachha* floor had comparatively higher incidence of bad conformation and lameness.

- The incidence of bad conformation based on purpose of horse rearing was recorded the highest in the ceremonial dance horses, followed by horse carting horses, patrolling purpose police horses, breeding purpose and race/ ridding horses, whereas the highest lameness incidence was recorded in the ceremonial dance purpose horses, followed by horse carting (*Baggi*) horses, ridding horses and breeding horses.
- Hoof trimming and shoeing practice in horses of Gujarat was carried out on 15 days to 8 months interval; where the lowest incidences of bad conformation and lameness were observed in the horses those were trimmed up to 1 month, whereas the highest incidence of bad conformation and lameness was observed in the >4 months of hoof trimming intervals.
- Overgrown hooves were recorded the highest amongst all other incidence of bad conformations, while incidence of canker was recorded the highest in the incidence of lameness.
- Equine lameness was recorded 19.25 percent; out of that 81.96 percent lameness was located at lower limbs. Amongst forelimb lameness 90.74 percent were recorded at lower limb, whereas 70.93 percent lower limb lameness was recorded in hindlimb.
- Higher incidence of lower hindlimb lameness (70.93%) was attributed to ceremonial dance and hindlimb walk with rider on back.

5. References

1. Dabareiner RM, Cohen ND, Carter GK, Nunn S, Moyer W. Musculoskeletal problems associated with lameness and poor performance among horses used for barrel racing: 118 cases (2000–2003). Journal of the American Veterinary Medical Association. 2005;227(10):1646-1650.
2. Naeini AT, Niak BT. Field study of the prevalence of lameness in horses in three provinces of Iran. Pakistan Veterinary Journal. 2005;25(3):140.
3. Mistry JN, Nirurkar SS, Patel PB, Chaudhary SR, Dabas VS. Equine Lameness - A Retrospective Study of 176 Animals. Intas Polivet. 2012;13(2):187-191.
4. Vadalia JV, Tank PH, Nikam PN, Desai BD, Javia CB, Katare M. Clinical documentation of foot affections in unsound working horses. Indian Journal of Field Veterinarians (The). 2011;6(4):24-27.
5. Stashak TS. Adams & Stashak's Lameness in Horses. 6th Edition: John Wiley & Sons Publication, UK. 2011_a;113(435):777-812.
6. Stashak TS. Adams & Stashak's Lameness in Horses. Trimming and shoeing for balance and soundness. 6th Edition: John Wiley & Sons Publication, UK; $c2011_b$. p. 1080-1142.