



COVID-19 pandemic: A lockdown experience with veterinary tele-health services in Kashmir

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ABSTRACT

Telehealth facility was launched to extend veterinary services throughout Kashmir valley. It was also desired for continuation of veterinary internship during the COVID-19 lock-down period. A total of 714 response forms were received from the participating veterinary faculty of clinical disciplines in six months. The majority (n=504, 70.6%) of the cases pertained to the dairy cattle. Thirty per cent (n=9/30) of the designated specialists participated. The tele-health facility was availed by interns (44.25%), farmers/animal owners (36.51%), field veterinarians (15.28%) and the para-veterinarians (3.97%) in significantly decreasing order. Telephone mobile calls, WhatsApp messages (text, photos and videos), and the SMS text messages were the platforms used. The animals with medical problems (67.66%) were significantly more than those showing gynaecological (18.25%) and surgical (14.09%) ailments. More than half (52.58%) of the cases were reported from the nearby three districts. The remaining (47.42%) animal owners resided in rest of the seven districts. Most of the complaints pertained to skin and appendages (27.18%), alimentary (25.79%) and reproductive tract (18.25%) in the affected cattle respectively. Udder and teat affections, metabolic diseases, and repeat breeding were tentatively diagnosed in majority of the cows. From this preliminary study, it is concluded that the veterinary telehealth service can reach far-off places and education can be continued amidst lockdown period. Short duration and lack of the follow up details are the weakness of this study. Additionally, more veterinary specialists need be persuaded to participate in telehealth modality.

Keywords: Cattle, Dairy, Kashmir, Telehealth, Telemedicine, Veterinary

Telemedicine; a subcategory of telehealth, involves digital exchange of information from a distance regarding a patient's clinical health status (AVMA 2019a,b). Veterinary telehealth is not a new concept, and most of the veterinarians since 1980 have been providing telephonic services to various stakeholders (Robertson 1999, Mars and Auer 2006). Veterinarians of this region use this facility occasionally without documenting any details in the hospital records.

With the unfortunate spread of pandemic COVID-19, the 'lockdown' was enforced throughout the country for several months at a stretch. In order to follow the standard operating procedures (SOP) like physical distancing and personal hygiene, the importance of telemedicine as an alternate way for rendering health services and simultaneously providing continuity in the learning-teaching programme of veterinary internship students was

realised. During the pandemic, the Food and Drug Administration (FDA) also decided to ease out some of the restrictions on veterinarians and allowed them better utilize telemedicine to address animal health needs (FDA 2020).

To mitigate the suffering of the dairy cattle and their generally poor owners residing in Kashmir valley and also to avoid delay in completion of the degree programme of outgoing veterinary graduates during the COVID-19 crisis situation, a telehealth service was launched by Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-Kashmir. The purpose of this paper is to present the modus operandi of this service and the extent of response it received from various stakeholders during the first six months of its implementation.

MATERIALS AND METHODS

Telemedicine portal was developed on the university website (www.skuastkashmir.ac.in) with a well-designed poster (Fig. 1) clearly highlighting: (a) 30 specialists from veterinary medicine (VM), animal reproduction, gynaecology and obstetrics (ARGO), and veterinary surgery

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VETERINARY TELE-MEDICINE SERVICES

Specialists

Medicine

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Dr. Zubair Akhoun
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Veterinary Scientists
ویشنری سائنسدان

Internes/Alumni
سابق اور موجودہ طالب علم

Para-vets
نیم ویشنری عملہ

Livestock Farmers/Pet Owners
مویشی پالتے والے

Communication channels: Phone, Whatsapp, Facebook, Movies, Photographs, e-mails.

Fig. 1. Veterinary telemedicine poster.

and radiology (VSR) from SKUAST-Kashmir who participated as panel experts. The panel comprised 5 Professors (3 VSR, 2 VM), 3 Associate Professors (VM 2, VSR 1) and 22 Assistant Professors (10 VM, 7 ARGO and 5 VSR); (b) Two para-veterinarians from the Division of Veterinary Clinical Complex (VCC) to attend the telephone calls of the stakeholders round the clock and provide them the contact details of the specialists of the clinical discipline based on the nature of the queries. Every clinician was sequentially given a chance to answer a query; (c) the chart describing the flow of information between different stakeholders. All the stakeholders were under COVID-19 complete lockdown staying in their residences. However, those posted in VCC also provided day time emergency service to the animals presented in this referral hospital.

The programme was initiated in the first week of May 2020 after getting permission to dedicate a portal on the university website. Two local newspapers carried the public notice and the government owned television channel (Doordarshan Kendra, Srinagar) made announcement. The experts were requested to fill in an online form comprising

SKUAST-K, TeleMedicine Services

Professionals are required to fill in the details of TeleMedicine Service conducted

* Required

Date of Service *

Date
dd-mm-yyyy

Name & Designation of Scientist *

Your answer

Client Type & Contact details *
(Farmer/Pet owner/ Security agency/ Para-vet/Intern/Alumnus), Residence, Phone no

Your answer

Animal/Patient *
(Species, Breed, Age, Sex)

Your answer

Complaint/Symptoms *

Your answer

Tentative Diagnosis *

Your answer

Disposal *
(treatment/referral)

Your answer

Submit

Fig. 2. Proforma filled by consultants on SKUAST-Kashmir telemedicine web portal.

of seven parameters (Fig. 2) on the telemedicine web page after every consultation. The details provided in the forms pertaining to the dairy cattle reared in all the 10 districts of Kashmir province uploaded on the portal during first six months (May 2020 to October 2020) were retrieved. The data was classified and converted to percentages. The Z

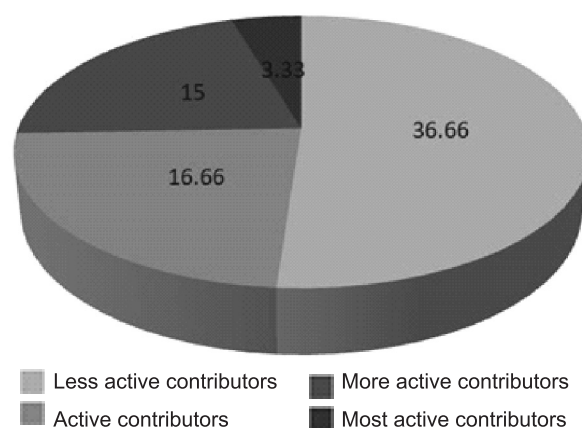


Fig. 3. Number of the participating consultants.

Table 1. Distribution (%) of dairy cattle cases across different districts

District	Medicine	Gynae	Surgery	Total
Anantnag	5.87 ^b (20)	5.43 ^a (5)	2.82 ^a (2)	5.36 ^{ab} (27)
Badgam	10.56 ^{cd} (36)	9.78 ^{ab} (9)	7.04 ^{ab} (5)	9.92 ^d (50)
Bandipore	7.33 ^{bc} (25)	9.78 ^{ab} (9)	11.27 ^{bc} (8)	8.33 ^{cd} (42)
Baramulla	10.26 ^{cd} (35)	3.26 ^a (3)	14.08 ^{bc} (10)	9.52 ^d (48)
Ganderbal	19.35 ^e (66)	16.30 ^b (15)	14.08 ^{bc} (10)	18.06 ^e (91)
Kulgam	2.64 ^a (9)	4.35 ^a (4)	2.82 ^a (2)	2.98 ^a (15)
Kupwara	4.11 ^{ab} (14)	8.69 ^{ab} (8)	5.63 ^{ab} (4)	5.16 ^{ab} (26)
Pulwama	15.25 ^{de} (52)	19.57 ^b (18)	19.72 ^c (14)	16.67 ^e (84)
Shopian	6.74 ^{bc} (23)	6.52 ^a (6)	2.82 ^a (2)	6.15 ^{bc} (31)
Srinagar	17.89 ^e (61)	16.30 ^a (15)	19.72 ^c (14)	17.86 ^e (90)
Total	(341)	(92)	(71)	(504)

Percentage values across the rows in a particular column bearing different small case superscript differ significantly ($P<0.05$). Values in parenthesis are the actual number of cases.

test of population proportions was employed for comparing case distribution among districts and clinical disciplines using open-source statistical calculator available at www.socscistatistics.com.

RESULTS AND DISCUSSION

Varied contribution to tele-medicine services by empanelled consultants was observed (Contributors: 66.67% and Non-Contributors: 33.33%) (Fig. 3). Total 714 response forms were completed and submitted by the responding veterinary clinical specialists during the study period. Majority of the cases ($n=504$, 70.6%) pertained to the dairy cattle.

Two-third (20/30) of the consultants duly filled at least one response form after providing tele-health service to any stakeholder. Nine (9/30, 30%) including 2 Professors, 1 Associate Professor and 6 Assistant Professors completed more than 10 forms each during the six months of the study period. Among them 5, 3 and 1 submitted from 11 to 40, 41 to 70 and 91 forms respectively.

Telephone mobile calls, WhatsApp messages, photos and videos, and the text messages were the major platform used. E-mail text and photo and video attachment was also used occasionally.

During the six months of the study period, the tele-health facility was availed by interns ($n=223$, 44.25%), farmers/animal owners ($n=184$, 36.51%), field veterinarians ($n=77$, 15.28%) and the para-veterinarians ($n=20$, 3.97%). There was significant ($P>0.05$) difference between the percentage of the participating stakeholders.

As per the responses received, the medical problems (67.66%) were significantly higher than gynaecological (18.25%) and surgical (14.09%) ailments. The case distribution details from different districts of Kashmir valley attended through telemedicine by the professionals from the relevant clinical disciplines is presented in Table 1 and distribution in terms of case type is given in Table 2. The maximum number of cattle with medicinal problems was

Table 2. Distribution (%) of dairy cattle cases by veterinary discipline

District	Medicine	Gynae	Surgery	Total
Anantnag	74.07 ^b (20)	18.52 ^a (5)	7.40 ^a (2)	(27)
Badgam	72.00 ^b (36)	18.00 ^a (9)	10.00 ^a (5)	(50)
Bandipore	59.52 ^b (25)	21.43 ^a (9)	19.05 ^a (8)	(42)
Baramulla	72.91 ^c (35)	6.25 ^a (3)	20.83 ^b (10)	(48)
Ganderbal	72.53 ^b (66)	16.48 ^a (15)	10.99 ^a (10)	(91)
Kulgam	60.00 ^b (9)	26.67 ^{ab} (4)	13.33 ^a (2)	(15)
Kupwara	53.85 ^b (14)	30.77 ^{ab} (8)	15.38 ^a (4)	(26)
Pulwama	61.90 ^b (52)	21.43 ^a (18)	16.67 ^a (14)	(84)
Shopian	74.19 ^b (23)	19.35 ^a (6)	5.45 ^a (2)	(31)
Srinagar	67.78 ^b (61)	16.67 ^a (15)	15.56 ^a (14)	(90)
Total	67.65 ^b (341)	18.25 ^a (92)	14.09 ^a (71)	(504)

Percentage values across the columns in a particular row bearing different small case superscript differ significantly ($P<0.05$). Values in parenthesis are the actual number of cases.

reported from Ganderbal (19.35%), Srinagar (17.89%) and Pulwama (15.25%) districts respectively. The minimum number of consultations was sought from Kulgam (02.64%). The cases reported from Ganderbal and Srinagar were significantly ($P>0.05$) more and those from Kulgam significantly ($P<0.05$) less than all other districts.

Telemedicine service provided for the number of ailing cows with gynaecological problems were maximum from Pulwama (19.57%) followed by Srinagar and Ganderbal (16.30% each). Lowest number of such cases were reported from Baramulla (3.26%). Significantly less ($P<0.05$) telephonic veterinary advice was sought from Anantnag, Baramulla, Kulgam and Shopian than the remaining districts. Teleconsultation for various surgical ailments in dairy cattle were recorded maximum from 2 districts; Pulwama and Srinagar (19.72% each) and least from 3 districts; Anantnag, Kulgam and Shopian (2.82% each). The expert opinion was obtained for animals from 5 (Pulwama, Srinagar, Ganderbal, Baramulla and Bandipore) districts more significantly ($P>0.05$) than those from the remaining districts.

Among the different districts, the overall benefit of the telemedicine facility was opted maximum by the stakeholders from Ganderbal (18.05%) followed by Srinagar (17.86%) and Pulwama (16.67%) respectively. The values were significantly higher ($P>0.05$) than all the remaining seven districts. Significantly lowest ($P<0.05$) percentage of dairy cases were reported from Kulgam, Kupwara and Anantnag.

Most of the complaints in the affected cattle received by the veterinary specialists pertained to skin and appendages ($n=137$, 27.18%) followed by alimentary tract ($n=130$, 25.79%) and reproductive tract ($n=92$, 18.25%) respectively. Among the medical problems, mastitis ($n=60$, 11.90%), milk fever ($n=30$, 5.95%) and ketosis ($n=16$, 3.17%) were tentatively diagnosed in maximum number of animals. Repeat breeding ($n=21$, 4.16%), retention of placenta ($n=13$, 2.58%) and metritis ($n=10$, 1.98%) were

the most frequent reproductive problems encountered. Teat affections (n=38, 7.54%) outnumbered all other surgical ailments. Lameness (n=11, 2.18%) and wounds (n=5, 0.99%) were the other more frequently reported diseases.

The COVID-19 pandemic created the most urgent platform for change that the veterinary profession has ever seen (Manketlow 2021). The benefits of telemedicine are assumed to be similar in human and veterinary practice. They include; better service to patients throughout urban and rural areas, increased access to specialists and specialist services, supporting isolated doctors, reduced cost, saving time, overcoming shortages of veterinarians, deliver awareness, education and facilitate research (Mars and Auer 2006). Though the AVMA distinguishes between the two, telehealth and telemedicine are often used interchangeably in literature and clinical settings (Watson *et al.* 2019). This alternate modality presents an opportunity to expand utility of the veterinary medicine by increasing access to healthcare services for animal owners.

Two paraclinical personnel each with more than one decade experience in veterinary hospital or livestock farms who acted as link between the stakeholders and the experts could satisfactorily communicate with the callers and classify cases on the basis of the clinical picture of the ailing cattle into any one of the three clinical disciplines. Among the 30 veterinary clinicians included in the panel, only 40% uploaded more than 10 response sheets on the portal during six months of the study period. Although most of the veterinarians actively engaged in clinical practice in India render free telehealth services routinely but generally do not record or reflect it. In a recent study elsewhere, half of the respondent veterinarians never or hardly ever utilized telehealth or telemedicine (Watson *et al.* 2019). In order to stay relevant in this digital world and provide optimum quality service to the public, all the veterinarians need to utilize the telehealth in their practice.

Majority (70.6%) of the animals for whom telemedicine facility was availed comprised of the dairy cattle. The livestock owners in Kashmir, generally maintaining one or two cows only per family therefore show more concern towards their health than those rearing comparatively a greater number of sheep or goats. The number of the veterinary interns (44.25%) participated maximum in telehealth among all the stakeholders. The outgoing interns exposed to the field/rural conditions gained confidence in managing animal patients and satisfy their owners under the supervision of a faculty member located at a distance. Online learning served as a panacea in the time of COVID-19 crisis (Dhawan 2020).

The farmers/animal owners (36.51%) also availed the telehealth facility more significantly ($P>0.05$) than field vets and paravets. Unlike the developed countries where large organized dairy farms exist, in Kashmir, only one or two cows are reared as a subsidiary activity by economically weak rural families (Bhattacharyya *et al.* 2009). The daily income of the animal owner gets badly affected from the loss of milk production from their ailing dairy cattle. They

therefore frequently seek veterinary intervention; cheaper the better. Field veterinarians and para-veterinarians get specialist consultation only when they encounter problems in disease diagnosis or obtain poor response to the treatment of animals under their care.

Cattle with medical problems (67.66%) were significantly more ($P>0.05$) than those showing gynaecological-obstetrical (18.25%) and surgical (14.09%) ailments. In the developing countries where livestock are physically presented in a veterinary hospital for disease diagnosis and treatment, those with medicinal ailments generally outnumber the gynaeco-obstetrical and surgical cases (Rahman *et al.* 2012).

The VCC located at the border line between Ganderbal and Srinagar districts of Kashmir valley receives physically more than 95% of cattle from these two districts only. The remaining 5% cattle generally belong to the three nearby districts; Bandipora, Badgam and Pulwama (personal observation). The results of this study therefore indicate that cattle from 8 of the 10 distant districts (that are rarely physically presented in the university veterinary hospital) constituted 64% of the animals that were provided telehealth services. The important benefit of utilizing telehealth in practice is that it may enable veterinarians to remotely provide better services to the communities (Watson *et al.* 2019).

The results of this study indicate that the number of animals with affections of skin and appendages, alimentary and reproductive tracts was higher. Also, the diseases; acute mastitis, repeat breeding and teat affections outnumbered others. Almost similar prevalence pattern of diseases is recorded in cattle physically presented for disease diagnosis and treatment at VCC (Fazili *et al.* 2003, Wani and Bhat 2003, Bhat *et al.* 2015).

Although the address and the mobile numbers of most of the stakeholders were recorded but the follow up of the cases and the satisfaction of the dairy farmers/owners was not undertaken in this study. Perusal of the available literature pertaining to the pre-COVID-19 period indicate that during virtual consultations, the owners are satisfied and the animals within their premises unexposed to the clinical examination of a veterinarian also more comfortable (Brag *et al.* 2015, Bishop *et al.* 2018). Considering the risks and the expenses involved in transportation of heavy dairy cattle; owned only by weaker section of our rural society, telehealth a promising modality even under normal situations can be a feasible catholicon during disasters and pandemics.

Comparatively short duration (six months) is another limitation of this study. However, early compilation of the results and reporting of the benefits may encourage a greater number of veterinary clinicians to practice telehealth in this ongoing COVID-19 scenario in India.

From this preliminary study, it is concluded that unlike conventional dairy cattle veterinary practice, the telehealth services can reach-out to a greater number of distantly located ailing animals and provide relief to poor farmers of

this developing nation. The weakness of this short study is that follow up of the cases and the animal owner/farmer satisfaction could not be ascertained. The study also emphasized the need of continuing education programs so that large number of the veterinary specialists are motivated to practice telehealth. The coronavirus pandemic made various teleservices all the more vital, and their significance may increase with time.

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