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Rectal bleeding and implications for surgical care in Nepal

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Abstract

Background—Because rectal bleeding is a cardinal symptom of many colorectal diseases including colorectal cancers, its presence alone could give insight into the prevalence of these conditions where direct population screening is lacking. In South Asia, which is home to over one fifth of the world's population, there is paucity of epidemiologic data on colorectal diseases, particularly in the lower-income countries (LIC) such as Nepal. The aim of this study is to enumerate the prevalence of rectal bleeding in Nepal and increase understanding of colorectal diseases as a health problem in the South Asian region.

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There are no conflicts of interest to disclose.

Methods—A countrywide survey utilizing the Surgeons OverSeas Assessment of Surgical Need (SOSAS) tool was administered from May 25th to June 12th 2014 in 15 of the 75 districts of Nepal, randomly selected proportional to population. In each district, three Village Development Committees were selected randomly, two rural and one urban based on the Demographic Health Survey methodology. Individuals were interviewed to determine the period and point prevalence of rectal bleeding, and patterns of health-seeking behavior related to surgical care for this problem. Individuals aged over 18 were included in this analysis.

Results—A total of 1350 households and 2,695 individuals were surveyed with a 97% response rate. Thirty-eight individuals (55% male) of the 1,941 individuals 18 years and older stated they had experienced rectal bleeding (2.0%, 95% CI 1.4% to 2.7%), with a mean age of 45.5 (SD 2.2). Of these 38 individuals, 30 stated they currently experience rectal bleeding. Healthcare was sought in 18 participants with current rectal bleeding, with 2 major procedures performed, one an operation for an anal fistula. For those who sought healthcare but did not receive surgical care, reasons included no need (4), not available (6), fear/no trust (5) and no money for healthcare (1). For those with current rectal bleeding who did not seek healthcare, reasons included no need (1), not available (2), fear/no trust (6) and no money for healthcare (3). Twenty-three individuals had an unmet surgical need secondary to rectal bleeding (1.2%, 95% CI 0.8% to 1.8%).

Conclusion—The Nepal healthcare system at present does not emphasize the importance of surveillance colonoscopies or initial diagnostics by a primary care physician for rectal bleeding. Our data demonstrate limited access for patients to undergo evaluation of rectal bleeding by a healthcare professional, and that potentially there are people in Nepal with rectal bleeding that may have undiagnosed colorectal cancer. Further advocacy for preventative medicine and easier access to surgical care in LIC is crucial to avoid emergency surgeries, advanced stage malignancies or fatalities from treatable conditions.

Keywords

Rectal bleeding; Nepal; Global surgery; anorectal disease; south east Asia; Surgeons OverSeas; access to surgical care

Background

Inadequate access to comprehensive surgical care for communities in low and middle-income countries (LMICs) has emerged as a global health priority^{1,2,3,4}. Surgical disease has been defined by pathology for which an invasive procedure is required for treatment, palliation, or cure⁴. Some surgical diseases present with trigger signs or symptoms that require further investigation and may ultimately lead to a surgical therapy. A breast mass, atypical cervical exam, or rectal bleeding are examples of these types of presenting scenarios. This definition is critically important for policy makers working to understand the burden of surgical disease and develop systems that are capable of successfully evaluating and treating surgical patients. The breadth of this definition is extensive and can be a challenging feature when considering resource allocation and cost-effectiveness. The World Health Organization has characterized a subgroup of surgical interventions as Emergency and Essential Surgery (EES) that reduces disability or saves lives⁶. Advocates for EES have described strategies for moving these services closer to the forefront of the complex political

economy of global health policy. The resources allocated to EES belie the data showing that improvements in surgical care at district hospitals are cost-effective public health interventions^{7, 8}. This is evidence of the unfortunate designation of surgical care as the “neglected step-child” of global health. Much of these data however applies to high acuity surgical disease. The data describing the burden of sub-acute surgical conditions and the cost-effectiveness of treatment in low and middle-income countries are currently lacking.

Malignant and benign diseases of the colon, rectum and anus encompass a vast spectrum of disorders that can affect the quality of life and reduce overall survival. The standard of care for evaluation and management of colorectal diseases requires the full breadth of diagnostic and therapeutic options, often requiring a surgical provider and/or intervention. The presence of colorectal bleeding significantly raises suspicion for pathology of the lower gastrointestinal tract and may be a heralding sign of a surgical disease.

Population based data on such surgical pathologies is lacking in LMICs. To address this need, Surgeons OverSeas, a non-governmental organization, created the Surgeons OverSeas Assessment of Surgical Need survey tool to obtain population level data for general surgical needs specifically in LMICs. To date, the SOSAS survey has been executed in Rwanda and Sierra Leone (Petroze, Surgery 2012, Groen RS 2012 Lancet). Data from countries outside of sub-Saharan Africa are lacking. Thus the objective of this study is to provide epidemiologic data at a population based level of rectal bleeding using the SOSAS survey tool in Nepal, a low-income country in South Asia.

Methods

Setting

The Federal Democratic Republic of Nepal is a South Asian country with a population of just over 27 million people. Bordered between The People’s Republic of China on the north and the Republic of India on the south, west, and east, Nepal is a landlocked nation caught between two global economic, social, and political powerhouses that are at the center of a globalizing Asia and South Asia. In the 2000 WHO report comparing health systems, Nepal ranks 150 out of 191 member nations of the WHO. The per capita expenditure on health in Nepal compared to the WHO Regional average for South-East Asia is consistently lower. This gap is also widening, possibly due to globalizing forces in the region. In 2012, the regional average for per capita total expenditure on health was US\$70 while in Nepal is was around US\$35⁹.

The Nepalese Gross National Income per capita in 2013 was US\$730 and roughly 25% of the population was at or below the national poverty line¹⁰. Nepal, though a low-income country, has implemented health system improvements over the last decade to improve access to care and essential medicines. Since 2006, increasing numbers of essential medicines have been made available free of charge at government run care delivery sites. Government subsidies are available for certain cancers, heart disease and kidney disease and there are incentive programs to encourage pregnant women to deliver at health care facilities. Pilot programs of community-based health insurance exist in 6 districts of Nepal, however the coverage is still sparse and there are no other options for public insurance

programs. This leaves most people with high out-of-pocket expenses for most health care needs¹¹.

The Surgeons OverSeas Assessment of Surgical Need (SOSAS) is a validated population based surgical need survey tool divided into two sections described in detail previously (Groen RS, Pilot study Sierra Leone). The first section collects demographic data from the head of the household regarding access to healthcare and recent deaths in the household. The second section selects two household members randomly; each member undergoes a verbal head to toe examination of 6 anatomical regions: 1) face, head and neck, 2) chest and breast, 3) abdomen, 4) groin and genitalia, 5) back and 6) extremities. Each respondent verbally elicits symptoms or experiences associated with a spectrum of general surgical conditions including wounds, masses, deformities, burns, injuries and rectal bleeding.

A countrywide survey utilizing the SOSAS survey tool was administered from May 25th to June 12th 2014 in Nepal. Nepal consists of 75 districts; 15 of the 75 districts of Nepal were randomly selected proportional to population. In each district, after stratification for rural and urban based on DHS methodology, three Village Development Committees (VDC) were randomly selected. Interviewers began at a central location and sampled every 5th household within a selected VDC; thirty households per VDC were sampled, with a total sample size of 1,350 households. Sample size estimation was calculated from a prevalence of unmet surgical need of 5%, reported in a pilot study of SOSAS in Nepal in January 2014 (Gupta, Pilot in Pokhara, World Journal of Surgery 2014).

The surveys were conducted by a total of 100 Nepali medical interns and students. All surveys were administered in Nepali and the responses recorded in English via paper surveys. Individuals were interviewed to determine the period and point prevalence of rectal bleeding, and patterns of health-seeking behavior related to surgical care for this problem.

Institutional Review Board (IRB) approval was obtained from the Nepal Health Research Council in Kathmandu, Nepal and Nationwide Children's Hospital in Columbus, Ohio, USA. Verbal consent was obtained from all respondents prior to the survey. Individuals noted to be cognitively impaired by the household members were excluded from the study; household members of all ages were included in the survey, but only those individuals aged over 18 were included in this analysis.

Data were analysed in STATA 13.0 (StataCorp, College Station, TX, 2013). Estimated proportions of rectal bleeding were reported with respective 95% confidence intervals and were compared by sex, village type (rural or urban), occupation, education and literacy using univariate analyses performed with chi-squared tests. Odds ratios of rectal bleeding amongst various covariates were calculated with a logistic regression model.

Results

Data were collected and analyzed from 1,350 households, yielding 2,695 respondents with a response rate of 97%. Of the 2,695 individuals surveyed, the mean age of respondents was 31.03 years (SD 19.1); 53.2% of respondents were male (n=1,434) and 46.8% female

(n=1,261). The mean survey time for each household was 19.8 minutes, including the interview for the head of the household and the two individual interviews.

Thirty-eight individuals (55% male) of the 1,942 individuals 18 years and older stated they had experienced rectal bleeding (2.0%, 95% CI 1.4% to 2.7%), with a mean age of 45.5. Demographics of individuals who have experienced rectal bleeding are noted in Table 1. Occupation was the only covariate with a statistically significant increase in odds of rectal bleeding for homemakers, non-government employees and government employees, when compared to those who are unemployed (Table 1).

Of these 38 individuals, 30 stated they currently experience rectal bleeding. Healthcare was sought in 18 participants with current rectal bleeding. Two participants had major procedures performed. One procedure was an operation for an anal fistula; the other participant was unaware of the surgical operation that had been performed. For those who sought healthcare but did not receive surgical care, reasons included no need (n=4), not available (n=6), fear/no trust (n=5) and no money for healthcare (n=1). For those with current rectal bleeding who did not seek healthcare, reasons included no need (n=1), not available (n=2), fear/no trust (n=6) and no money for healthcare (n=3). Nine individuals with rectal bleeding sought healthcare from a traditional healer first rather than a primary, secondary or tertiary healthcare center.

Perceived disability from rectal bleeding was assessed. Of the 38 respondents, 23 (60.5%) stated their rectal bleeding was not disabling; 9 felt ashamed of their rectal bleeding (23.7%) and 6 (15.8%) stated they are currently unable to work as they used to prior to having rectal bleeding.

Excluding individuals who perceived no need for healthcare for his or her rectal bleeding, twenty-three individuals had an unmet surgical need secondary to rectal bleeding (1.2%, 95% CI 0.8% to 1.8%). The most common barrier of accessing surgical care was fear/no trust in the medical system (n=11, 47.8%), followed by personnel or resources were not available (n=8, 34.8%).

Discussion

This study is the first nationwide population based assessment of general surgical needs performed in Nepal. We show that 2.0% of individuals in Nepal over 18 years old have experienced rectal bleeding, with 1.2% of the population studied unable to obtain at least a surgical consultation for such symptoms. Extrapolating the above results to the country's 2014 adult population, potentially 170,300 individuals in Nepal currently have rectal bleeding and are unable to access appropriate care.

Such a countrywide cross-sectional survey assessing symptoms of non-emergent surgical diseases at a population level is a useful adjunct to the existing data on poor access to emergency surgical care. Improving access for individuals with surgical disease around the globe means not only consideration of the immediately life threatening conditions such as obstetric emergencies and the acute abdomen, but also evaluation and treatment for indolent

disorders that require definitive surgical management such as benign anorectal disease, malignancy, and many others.

The above data reveal that perhaps nearly 1.2% of Nepal's adult population may have current rectal bleeding, but is unable to access adequate healthcare. The barriers to surgical care for the majority of individuals who sought evaluation included poor availability and fear/distrust. The majority of respondents who did not seek surgical care cited their primary reason as fear/distrust. These data may highlight the need for increased outreach and education to communities in LMIC about the nature of surgical care and surgical disease. Ethnography may be a critical piece of this effort as cultural impressions of health and disease are profoundly different from community to community. These differences are likely of particular importance when it comes to the unique sort of vulnerability associated with surgical intervention and the personal trust necessary for patients to have with their surgical provider. For example, in our data of the 38 individuals with rectal bleeding, 9 sought healthcare from a traditional healer (23.7%, 95% CI 11.4 – 40.2%). Perhaps individuals of certain communities feel more comfortable discussing vulnerable issues with a traditional healer, rather than seeking out healthcare from a public facility.

Multiple studies have reported epidemiologic differences in the causes of lower gastrointestinal bleeding between Eastern and Western populations^{12–16}. Basaranoglu and colleagues interviewed roughly 700 patients in Turkey, aged 18 to 86, where 79 had rectal bleeding and 43 sought medical care. The majority of rectal bleeding was due to hemorrhoids and anal fissures, followed by amebic colitis and ulcerative colitis. In this series, evaluation was limited to physical exam, complete blood count, microscopic examination of stool and occasional endoscopy and/or imaging. Twenty-one percent received sigmoidoscopy and 16% received double-contrast barium enema. Biopsies were not included in the evaluation, leaving suspicion for wrong diagnoses or missed malignancy¹². In a study out of New Delhi, 240 patients with rectal bleeding all received a colonoscopy, and non-specific colitis and ulcers were the predominant diagnoses. This cohort also included 53 children where the majority of bleeding was caused by juvenile polyps¹³. Other important lesions that are cited in these studies, however with far lower prevalence, include colonic tuberculosis and malignancy^{14, 15}. A series out of Singapore retrospectively analyzed 547 admissions for rectal bleeding of which 87% were perianal conditions diagnosed at bedside¹⁶. The most common pathologies diagnosed on colonoscopy included diverticular disease, malignancy and adenoma. Tong et al pooled over 70,000 patients from 38 Medline and Embase studies published between 1985 and 2012 to determine the diagnostic value of rectal bleeding associated with colorectal cancer. By their calculations, in patient's over 30 years old 6 out of 100 patients with rectal bleeding have cancer¹⁷. Extrapolating that to the Nepalese numbers of rectal bleeding in our data, 10,218 patients with rectal bleeding may be harboring a treatable cancer.

These data taken together can provide some perspective on rectal bleeding in Asian countries. Bedside physical exam with proctoscopy is a high yield maneuver, as is demonstrated by the study population in Singapore where nearly 9 in 10 patients were diagnosed at the bedside. Training that emphasizes these skills could likely diagnose a majority of the patients with treatable surgical disease of anus and allow for more efficient

resource allocation to evaluate the more proximal rectum and colon with endoscopy. Also, infectious causes of blood per rectum need to be part of the surgical providers' standard evaluation in Asian countries. Lastly, while endoscopy for evaluation of rectal bleeding is a costly intervention, developing a tailored treatment algorithm for these resource-limited settings that includes endoscopic evaluation is critical for identifying a significant number of diagnoses, especially in children where a large proportion of patients likely have juvenile polyps causing rectal bleeding.

There are next steps that can be taken based upon our data and the available information related to rectal bleeding in Asian/Southeast Asian populations. Given that fear/distrust is a substantial barrier to seeking care, a comprehensive strategy on improving health-seeking behavior would be beneficial. This would likely take the form of community focus groups, engagement with local leadership and traditional healers, and increasing the availability of providers. As noted in the above data, a large percentage of rectal bleeding may be related to anal fissure and hemorrhoids. Conveniently, the diagnosis of these conditions is with physical exam and the treatment algorithms begin with non-procedural interventions. Education and outreach for local providers on the skills for the initial management of these common ailments may benefit a large proportion of patients with rectal bleeding, be attainable with reasonable resources, and identify those patients who do not respond to initial therapy and who would require higher levels of care. Designing and implementing effective data collection systems would allow for ongoing monitoring and evaluation of programs and furthering a more robust appreciation of health related behaviors, patient demographics, burden of disease, and barriers to care. Lastly, developing a referral tracking system would help to elucidate the available provider resources, establish effective networks of care, and move patients to the appropriate provider to address more complex disease. The success of any of these initiatives related to anorectal disease would likely be a useful template on which to expand the programs to include information related to other surgical diseases in Nepal.

This study inevitably has limitations. Limitations inherent to any study with a cross-sectional survey methodology and randomization assumptions apply to our study. The assessment relied on self-reported verbal responses and the limitations of memory and recall thus apply. Though the SOSAS tool was validated in Nepal with the addition of a visual physical examination (Gupta et al, Countrywide Nepal), this visual examination excluded the groin and genitalia. Because the visual examination did not investigate the groin or genitalia of the respondents, reports for rectal bleeding were based solely on verbal responses and may have resulted in social desirability bias. Furthermore, based on available resources, only 15 of Nepal's 75 districts were sampled proportional to population; thus this sampling methodology likely selected more densely populated districts, as opposed to more rural areas of Nepal more likely to experience barriers in access to healthcare.

Conclusion

Much of the existing data on unmet need for surgical disease focuses on urgent or emergent conditions. These data are unlikely to capture information on pathology that presents as indolent symptoms and can be managed as outpatients. Data on the lost QALY/DALYs

associated with surgical diseases of this pace and severity is urgently needed to develop the optimal systems to address the disparity in access to comprehensive surgical care. This data on rectal bleeding in Nepal demonstrate a need to better understand the perceptions of surgical care among these communities and that, in fact, diseases of colon, rectum and anus are present in this population and to large extent completely unaddressed by qualified providers.

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Appendix 1. Questions in the SOSAS survey related to rectal bleeding

1. **Groin/genitalia:** Have you ever had a wound, burn, mass, deformity, leaking of urine or feces, bleeding from your bottom, bleeding from your penis or any other operation on your groin or genitalia?
☐ Yes
☐ No
2. **Groin/genitalia specifics:** Tell me what problem you have had.
☐ Wound due to an injury
☐ Wound not due to an injury
☐ Burn
☐ Mass/growth (solid – testicular cancer or hydrocele/cystocele)
☐ Deformity – congenital
☐ Deformity – acquired
☐ Leaking of urine or feces
☐ Abdominal distention
☐ Bleeding (per rectum)
☐ Bleeding (from the penis)
3. **Timing:** When did this problem occur?
☐ I have this problem now
☐ During the past 12 months
☐ Longer than 12 months ago
4. **At this moment:** Do you have this problem now (or during the last week)?
☐ Yes
☐ No
5. **Healthcare sought:** Did you go to a health facility or see a doctor/nurse for this problem?
☐ Yes
☐ No
6. **Traditional healer:** Did you go to a traditional healer, traditional doctor, witch doctor or bone setter for this problem?

____ Yes

____ No

7. Type of healthcare received: What kind of treatment did you receive?

____ None, no surgical care

____ Major procedure = a procedure which requires regional or general anesthesia

____ Minor procedure = dressings, wound care, punctures or suturing and I&D

____ Cesarean section (Abdominal delivery)

8. Reason for not having surgical care: What was the main reason not to go to a health facility to see a doctor/nurse or not to have an operation or dressing?

____ No money for healthcare

____ No money for transportation

____ No time (person died before arrangements)

____ Fear/no trust

____ Not available (facility/personnel/equipment)

____ No need (condition is not surgical)

9. Disability: Does this problem still impact your daily life?

____ The condition is not disabling

____ I feel ashamed

____ I'm not able to work like I used to

____ I need help with transportation

____ I need help with daily living

Table 1Demographic characteristics of those with rectal bleeding (Age $\geq$ 18)

Demographic	Frequency with rectal bleeding; n, (%)	Frequency without rectal bleeding; n, (%)	Total in study population; n, (%)
Sex			
Male	21 (2.1)	963 (97.9)	984
Female	17 (1.8)	931 (98.2)	948
Total	38	1,904	1,942
Village type			
Rural	25 (2.0)	1,242 (98.0)	1,267
Urban	13 (1.9)	662 (98.1)	675
Total	18	1,904	1,942
Occupation			
Unemployed	3 (0.1)	371 (99.9)	374
Homemaker	12 (22.2)	527 (78.8)	539
Domestic helper	1 (1.6)	61 (98.4)	62
Farmer	3 (1.0)	293 (99.0)	296
Self-employed	8 (1.9)	418 (98.1)	426
Government employee	6 (4.4)	130 (95.6)	136
Non-government employee	5 (4.8)	99 (95.2)	104
Total	38	1,899	1,937
Literacy			
Illiterate	14 (2.5)	538 (97.5)	552
Literate	24 (1.7)	1,363 (98.3)	1,387
Total	38	1,901	1,939
Education			
None	15 (2.5)	594 (97.5)	609
Primary	5 (1.3)	384 (98.7)	389
Secondary	8 (1.5)	522 (98.5)	530
Tertiary	8 (2.3)	343 (97.7)	351
Graduate	2 (3.3)	58 (96.7)	60
Total	38	1,901	1,939

Table 2

Proportion of respondents with rectal bleeding and associated univariate analysis

Demographic	Proportion with rectal bleeding	Crude OR (95% CI)	P-value
Sex			
Male	2.13 (1.33, 3.24)	Reference	0.80
Female	1.79 (1.05, 2.86)	0.92 (0.48, 1.75)	
Village type			
Rural	1.97 (1.28, 2.90)	Reference	0.91
Urban	1.93 (1.03, 3.27)	1.04 (0.53, 2.05)	
Occupation			
Unemployed	0.80 (0.17, 2.33)	Reference	0.0001
Homemaker	2.23 (1.16, 3.86)	8.21 (2.31, 29.21)	
Domestic helper	1.61 (0.04, 8.66)	6.03 (0.62, 58.85)	
Farmer	1.01 (0.21, 2.93)	3.76 (0.75, 18.70)	
Self-employed	1.88 (0.81, 3.67)	6.98 (1.84, 26.42)	
Government employee	4.41 (1.64, 9.36)	16.85 (4.17, 68.19)	
Non-government employee	4.81 (1.58, 10.86)	18.4 (4.33, 78.12)	
Literacy			
Illiterate	2.54 (1.39, 4.22)	Reference	0.49
Literate	1.73 (1.11, 2.56)	0.79 (0.41, 1.53)	
Education			
None	2.46 (1.38, 4.03)	Reference	0.14
Primary	1.29 (0.42, 2.97)	0.39 (0.14, 1.09)	
Secondary	1.51 (0.65, 2.95)	0.61 (0.26, 1.44)	
Tertiary	2.28 (0.99, 4.44)	1.25 (0.53, 2.98)	
Graduate	3.33 (0.41, 11.53)	1.89 (0.42, 8.47)	