Admission avoidance in acute epistaxis: a prospective national audit during the initial peak of the COVID-19 pandemic

Short title: COVID national epistaxis audit

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KEY POINTS

1. It appears safe to discharge a higher proportion of acute epistaxis patients from the ED than seen in the 2016 national audit, including those with non-dissolvable packs.
2. The incidence of acute epistaxis during the initial peak of the COVID-19 pandemic in the UK was relatively unchanged compared with the rate seen in the 2016 national audit.
3. Emergency departments continue to use non-dissolvable packs before referral to ENT in around half of cases.
4. ENT used dissolvable intranasal products more commonly than non-dissolvable packs.
5. Significant predictors of re-presentation were not being packed by the ED, taking antiplatelet treatment, having had failed cautery and having had recent epistaxis treatment.

ABSTRACT

Objectives

To report changes in practice brought about by COVID-19 and the implementation of new guidelines, and to explore factors relating to unscheduled re-presentations for patients discharged from the emergency department (ED).

Design

Prospective multicentre national audit over 12 weeks from 6th April 2020.

Setting

UK secondary care ENT departments.

Participants

Adult patients with acute epistaxis.

Main outcome measures

Re-presentation within 10 days for patients discharged from the ED.

Results

83 centres from all four UK nations submitted 2,631 valid cases. The majority of cases were ED referrals (89.7%, n=2,358/2,631). 54.6% were discharged from the ED following ENT review (n=1,267/2,322), of whom 19.5% re-presented within 10 days (n=245/1,259) and 6.8% were ultimately admitted (n=86/1,259).

46.7% of patients had a non-dissolvable pack inserted by ED prior to referral to ENT (n=1,099/2,355).

The discharge rates for ED patients and their subsequent re-presentation rates were as follows: non-dissolvable packs, 29.5% discharged (n=332/1125), 18.2% re-presented (n=60/330); dissolvable products, 71.1% discharged (n=488/686), 21.8% re-presented (n=106/486); cautery only, 89.2% discharged (n=247/277), 20.0% re-presented (n=49/245); and no intranasal intervention, 85.5% discharged (n=200/234), 15.2% re-presented (n=30/198).

Univariable logistic regression showed that not being packed by ED, antiplatelet medications, failed cautery and recent epistaxis treatment were significant predictors of re-presentation within 10 days.

Conclusions

Management of acute epistaxis was notably affected during the initial peak of the pandemic, with a shift towards reduced admissions. This national audit highlights that many patients who may previously have been admitted to hospital may be safely discharged from the ED following acute epistaxis.

INTRODUCTION

The SARS-CoV-2 (COVID-19) pandemic led to necessary changes in the management of common ENT emergency presentations internationally. Epistaxis is the most common emergency presentation to ENT,[1] with a patient presenting to UK in-hospital ENT teams every other day on average.[2] Several aspects of epistaxis management were considered to pose a risk of COVID-19 spread. Firstly, COVID-19 resides principally in the airway,[3,4] and so instrumentation of the upper aerodigestive tract (as indicated in the management of epistaxis) is a known risk factor for droplet formation and aerosol generation.[5,6] Secondly, non-dissolvable intranasal packs have traditionally been associated with hospital admission which, at the height of the initial peak of the pandemic, would have meant exposure to an environment with a higher prevalence than found in the community.[7,8]

In March 2020, new UK guidelines were issued for the management of epistaxis presenting to emergency departments (ED), in light of COVID-19.[9] The major shifts in practice proposed were: the use of dissolvable intranasal products (in particular by the ED), the avoidance of non-dissolvable packs; and the discharge of suitable patients once bleeding cessation is achieved. These changes presumably aimed to: minimise the personnel involved in managing the acute presentation; reduce intranasal instrumentation; reduce admission rates, with the ultimate goal of preserving hospital bed capacity for the anticipated COVID-19 demand; and avoid unnecessary interactions with healthcare services.

The implementation of these guidelines resulted in inevitable changes to established practices, shown to be safe over many years of epistaxis care. However, the safety of these new practices has not been assessed.

This article aims to:

1. Report the findings of a 12-week prospective audit of acute epistaxis care, conducted during the initial peak of COVID-19 in the UK.
2. Explore factors relating to unscheduled re-presentation to hospital in epistaxis patients discharged from the ED.

METHODS

The protocol for this study was published in advance at https://entintegrate.co.uk. This manuscript has been prepared with reference to the STROBE checklist for cohort studies.[10]

Ethical considerations

The Health Research Authority decision tool determined the study design to fall under the remit of audit, and so no ethical approval was required (available at: http://www.hra-decisiontools.org.uk/research/).

Study design and setting

A national prospective audit of the hospital management of acute epistaxis by UK secondary care ENT departments was conducted, in parallel to an audit of tonsillitis and peritonsillar abscess emergency care.[11] The audit was developed and run by INTEGRATE, the UK ENT Trainee Research Network. All UK ENT departments were invited to participate via advertisement, and registration with local audit and Clinical Governance Departments was required. Sites could open at any point during the prospective data collection period.

Participants

Consecutive patients with acute epistaxis, aged 18 years and older, and referred to ENT secondary care were eligible for inclusion, whether managed by telephone advice or face-to-face review. Traumatic epistaxis was excluded.

Data collection

Eligible cases were identified over a 12 week period, between 6th April and 29th June 2020. Each case was followed-up for 10 days. A standardised electronic case report form was created using Excel software (Microsoft Corporation, Washington, USA) and made available online (Supplementary material), incorporating data validation to encourage valid data entry and completeness. Data were initially held offline at each centre, and patient identifiable data were removed prior to submission to the project management team. Data were collected on: patient demographics; COVID-19 status; referring and reviewing clinicians; relevant comorbidities, medications history and administration; and intranasal management strategies.

Interim reports

The 12 week audit was divided into three 4-week periods. Two interim reports were produced (after periods 1 and 2) allowing for rapid feedback of management and preliminary outcomes to the UK ENT community. Both interim reports were disseminated electronically via ENTUK mailouts within 10 days of data submission and hosted online at https://entuk.org and https://entintegrate.co.uk.

Data analysis

The primary outcome was unscheduled re-presentation to hospital within 10 days for ED discharges. This intended to assess the safety of the lower rates of admission anticipated.

Univariable binary logistic regression analysis was used to identify significant determinants of the primary outcome measure. The level of significance was set at <0.05 with Bonferroni corrections applied, where applicable. Analysis was performed using R statistical software (R Foundation, Vienna, Austria).

RESULTS

Centres

Data were submitted by 83/86 UK centres who registered to take part (72 in England, 5 in Scotland, 3 in Wales and 3 in Northern Ireland). 2/83 centres submitted data covering the first period only. Centres opened on the dates shown in figure 1, alongside the median rates of epistaxis cases referred per centre per week.

Submissions

2,631 cases met the prespecified eligibility criteria across the three periods (834, 946 and 851 cases respectively). Characteristics of the population are shown in table 1. Data completeness was high with 99.4% (n=1,259/1,267) of cases having data for the primary outcome.

The majority of patients were referred from the ED (89.7% n=2,358/2,630), followed by the ward (5.3% n=140), then 'other' (not otherwise specified) (2.6% n=68) and then the GP (2.4% n=64).

45 patients (1.7%) underwent surgery or interventional radiology, including 37 SPA ligations (1.4%) and 3 radiological embolisations (0.1%). 18 patients were recorded as having died within the 10 day follow-up period (0.68%), with one death due to hypovolaemic shock in an inpatient who was bilaterally packed (0.04%). Four tumours were diagnosed: a juvenile nasal angiofibroma; a sinonasal undifferentiated carcinoma (SNUC); a sinonasal lymphoma; and a nasopharyngeal carcinoma. Six patients were reported as pregnant (0.23%).

COVID-19

Figure 1 shows the number of patients with suspected or confirmed COVID-19, at the time of presentation and following testing, for the three audit periods, alongside the UK incidence of COVID-19. The prevalence of COVID19 in our epistaxis patients was much lower than national averages at those times.

Acute management of ED patients

The intranasal management for each case was assigned into one of four categories: non-dissolvable packs; dissolvable products; cautery only; and, no intranasal intervention. Table 2 shows the sequential intranasal management strategies for epistaxis patients presenting to the ED. ED clinicians inserted a non-dissolvable pack in 46.7% of patients prior to ENT referral (n=1,099/2,355), with 22.1% receiving a non-dissolvable pack at some point from ENT (n=520/2,351), and 48.4% finishing their ED episode with a non-dissolvable pack (n=1,125/2,322).

ENT clinicians used a dissolvable intranasal product in 34.7% of patients overall (n=816/2,351), and in 61.1% of those receiving an intranasal product (n=816/1,336). The commonest reason given for not using a dissolvable product was that the patient was already packed (45.9% n=673/1,466), followed by bleeding severity (22.4% n=329/1,466), product not available (3.4% n=50/1,466), clinician not trained (3.3% n=49/1,466), patient choice, (0.5% n=8/1,466), suspected COVID-19 (0.1% n=1/1,466) and 'other' (not otherwise specified) (24.3%, n=356/1,466).

Bilateral packs were used in 7.9% of patients (n=186/2,356) and posterior packs in 1.5% (n=36/2,356).

Silver nitrate cautery was performed in 38.4% of ED patients at some point (n=891/2,319) and was declared successful in 73.4% of cases (n=654/891). It was the only intranasal management by ENT in 17.7% (n=417/2,351) and was classed as the definitive treatment administered in 11.9% (n=277/2,319).

Tranexamic acid was given intravenously (IV) to 16.4% of patients (n=350/2,131), orally to 5.0% (n=106), and applied topically to 3.8% (n=81).

A minority of patients were managed remotely with telephone advice only (6.8%, n=160/2,355). When seen face to face (n=2,195), the majority of patients were reviewed by pre-specialty grade junior doctors (48.3%, n=1,060) followed by specialty grade junior doctors (42.2%, n=926), consultants (7.9%, n=174) and then nurse practitioners (1.6%, n=35).

Admission to hospital from ED

Table 1 shows the discharge rates for patients presenting to the ED. The overall discharge rate was 54.6% (n=1,267/2,322). These data are visualised in Figure 2, stratified by intranasal management type. Discharge rates were highest in the cautery only group, and lowest in the non-dissolvable pack group.

If admitted to hospital from the ED, length of stay data were available for 99.2% (n=1,047/1,055). The majority of patients stayed ≥1 day (61.6%, n=645), with 28.8% (n=302) staying ≥2 days and 12.3% (n=129) staying ≥3 days. 15.5% (n=163) of admissions were for social, rather than clinical reasons.

Planned follow-up for ED discharges

No follow-up was arranged in 61.7% of patients (n=780/1,264) with 28.9% having face-to-face (n=365/1,264) and 8.5% having telephone appointments scheduled (n=107/1,264) (12 listed as 'other').

Unscheduled re-presentation of ED patients within 10 days

The re-presentation rates for ED discharges, related to management and relevant patient factors, are shown in table 1. The overall re-presentation rate was 19.5% for ED discharges (n=245/1,259) and 9.9% for ED

admissions (n=104/1,046). 6.8% of ED discharges and 5.7% of ED admissions were admitted following their re-presentations (n=86 and 60 respectively). The outcomes following re-presentation, stratified by intranasal management, are shown in table 3.

Univariable logistic regression showed not being packed by the ED, being on antiplatelet medication, having unsuccessful cautery performed and having had recent epistaxis treatment were significant predictors of re-presentation within 10 days (table 1).

DISCUSSION

COVID-19 led to significant disruption of well-established standards of care, but it is increasingly recognised that these changes may have unveiled positive developments in our management of certain conditions. This discussion focuses on the lessons that can be learned from the collective national experience regarding the management of acute epistaxis.

The 2016 UK epistaxis audit, also delivered by INTEGRATE, provides a pre-COVID-19 baseline for comparison.[2] The two audit cohorts appear similar in age and sex ratio, and the median number of cases treated by ENT per unit per month was relatively unchanged at 14 in 2016, and 12 in the COVID-19 dataset. This finding contrasts with the greatly reduced rates of ED presentation seen for other conditions,[12,13] possibly as patients are unable to defer management of acute haemorrhage.

COVID-19 and epistaxis

Period 1 data showed the highest prevalence of COVID-19 infection over the test periods. However, testing rates were initially lower, and perhaps targeted at those with symptoms suggestive of COVID-19, thus providing a strong pre-test selection bias. As a greater proportion of patients were tested, the proportion of positive test results reduced.

Overall re-presentation following discharge from the ED

Around 1 in 5 patients discharged from the ED during the study period had an unscheduled re-presented to hospital within 10 days (table 1). Although this rate may appear high, the outcomes of these re-presentations were largely favourable with only 6.8% of the ED discharge group being admitted to hospital at any point in their epistaxis management. This ED discharge group underwent a variety of intranasal managements, but no individual management strategy was found to be significantly worse than any other (table 1). Whilst this is non-interventional non-randomised observational data, and so liable to selection bias, the acceptable outcomes reported here suggest a larger group of patients may be suitable for discharge following their acute episode of epistaxis than previously understood.

Dissolvable intranasal products

The use of dissolvable products was notably higher in the present study than seen in the 2016 audit, likely as a result of the recommendation for their first-line use in the COVID-19 guidelines. More than a third of patients had a dissolvable agent used at some point compared to only 4.7% in 2016. ED use of dissolvable products was very low (2.0%, n=47/2,355). Moreover, where an intranasal product/pack was used by ENT, a dissolvable

agent was used more commonly than a non-dissolvable device (61.1% n=816/1,336, table 2). The main barrier to the further use of dissolvable products was reported as the presence of a non-dissolvable pack by the time of ENT review. Re-presentations for patients in whom a dissolvable product was the definitive intranasal management were not significantly higher (table 1) and subsequent rates of admission and packing were comparable to other strategies (table 3).

Non-dissolvable packs

BRS guidelines have previously recommended discharge as routine for dissolvable products, and this practice was largely followed during the audit period (figure 2, table 1).[14] COVID-19 era guidance for non-dissolvable packs also recommended discharge in suitable patients.[9] Although discharge rates were considerably higher than in the 2016 audit (where not one of the 520 patients was discharged from the ED with a non-dissolvable pack), the rates were still lower than for other groups (table 1).[2] Patient factors and clinical concern may account for some of this difference, reflective of the time it can take for practice to evolve in the absence of evidence of safety to reassure the managing clinicians. In this study, the re-presentation rate for those with non-dissolvable packs was not significantly different to other groups, suggesting the practice observed was safe.

It is known that patients find the insertion and presence of non-dissolvable intranasal packs painful, and they are reluctant to have them disturbed once in situ.[7] However, unless the pack is removed during the initial ENT review, the rates of cautery and the preferential use of dissolvable intranasal products will be severely restricted. Nearly half the patients presenting via the ED had a non-dissolvable pack inserted prior to ENT review (table 2), a finding similar to 2016. Perhaps unsurprisingly, dissolvable products were barely used by EDs, despite the new guidelines. Acknowledging the prominent role ED clinicians play in the management of acute epistaxis,[15] and engaging them in future practice recommendations, will be crucial to any further shifts in clinical practice.

Implications for clinical practice

COVID-19 will persist within the community for some time,[16] but there appears to be no reason to return to pre-COVID-19 epistaxis management practices. The avoidance of admission may be of benefit to patients and the health service alike: fewer interactions at healthcare facilities will reduce opportunities for viral transmission, may be more convenient to patients and is less resource intensive.

However, this must be weighed against the risk of adverse events. The 10-day re-presentation rate was taken as the primary outcome for this study. This makes direct comparison between the admitted and discharged cohorts challenging as factors prompting early re-presentation in the discharged group may have occurred during the inpatient stay for the admitted group. This may go some way to explain the higher re-presentation rate seen in the ED discharged group at 19.5%, nearly double that of the admitted group. This rate was also

higher than the 13.9% 30-day re-presentation rate seen in 2016 (though this figure is for the combined admitted and discharged cohorts). Importantly, most individuals re-representing could continue to be managed as outpatients, with only 6.8% initially discharged from ED eventually being admitted for inpatient care. Additionally, no adverse events were reported in the community. Given the observational nature of this study, it is not possible to reliably generalise the findings to other groups, but it has been shown that a greater proportion of patients with acute epistaxis can be safely managed at home than has traditionally been the case.

The new epistaxis guidelines, produced in light of the COVID-19 pandemic, may be responsible for a number of the changes in practice recorded in this study. The observed practice was found to be safe and, as such, no significant revisions to the guidelines are recommended.

Strengths and limitations of the study

This large prospective national study gives a comprehensive view of acute epistaxis management and is uniquely placed to learn from the changes in practice brought about by the initial peak of the COVID-19 pandemic in the UK. Despite the pandemic disruptions, extremely high levels of data completeness were seen.

This work is limited by its observational nature. Bleeding severity is the most important variable not accounted for, omitted due to the complexity in objectively assigning a grade. Additionally, the location of bleeding (anterior, posterior, multiple sites, unknown) was not collected. Management and outcomes from the planned follow-up appointments were similarly not collected and so rates of cautery post pack removal and subsequent unscheduled re-presentations are unknown.

It is likely that cautery, dissolvable packs and outpatient care are all associated with less severe cases, potentially enhancing their apparent success. Conversely, unscheduled re-presentation rates amongst admitted patients are also likely to appear artificially low, as many of the acute issues that would have led to re-presentation would have occurred during the acute admission and so not be accounted for in this metric. As such, re-presentation analysis of the ED admitted cohort is not reported herein. Finally, this prospective audit only included epistaxis patients referred to ENT secondary care and, as such, cannot comment on the management of patients exclusively cared for by the ED during this time.

CONCLUSION

Presentations with epistaxis during the initial peak of the COVID-19 pandemic were comparable to past data. Around 1 in 5 patients discharged from the ED during the study period re-presented within 10 days. The management of these cases, however, was notably affected, with a shift towards reduced admissions. This national study highlights that many patients who may previously have been admitted to hospital, with a variety of presentation and management factors, may be safely discharged from the ED following acute epistaxis.

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TABLES AND FIGURES

Table 1: Characteristics of study populations, with proportions admitted/discharged and re-presentation rates for ED discharges (with univariable regression analysis).

Table 2: Intranasal management strategies for ED patients.

Table 3: Outcomes following re-presentation by intranasal management

Figure 1: Combination graphic to communicate trends in data over 12-week audit period: 1) The bar chart forming the background shows sequential opening of centres across the UK as the audit period progressed, 2) The box and whisker plots show the median, range and interquartile range of epistaxis patients presenting per centre per week for each of the three 4-week audit periods, 3) The scatter plot and error bars are COVID-19 swab rates (%) (diamonds) and positive swab rates (%) (crosses) with 95% confidence intervals, 4) The grey line chart is the 7-day rolling average of UK cases from 1st March to 31st July (available at: https://coronavirus.data.gov.uk/cases).

Figure 2: Sankey chart visualising proportions of patients being admitted or discharged from the ED, with rates of subsequent re-presentation, stratified by definitive intranasal management.

Table 1: Characteristics of study populations, with proportions admitted/discharged and re-presentation rates for ED discharges (with univariable regression analysis).

Variable	Status	All epistaxis patients % (n)	ED admissions % (n)	ED discharges % (n)	Re-presentation rates of ED discharges % (n)	Univariable logistic regression p value
Overall	-	(2631)	45.4 (1055/2322)	54.6 (1267/2322)	19.5 (245/1259)	-
Sex	Female	45.7 (1201)	46.1 (494/1071)	53.9 (577/1071)	17.4 (100/574)	0.111
	Male	54.3 (1425)	44.8 (559/1249)	55.2 (690/1249)	21.2 (145/685)	
Age in years	Cohort Median (Range) (Interquartile range)	74 (18 to 102) (63 to 83)	76 (19 to 99) (66 to 84)	73 (18 to 102) (61 to 82)	Re-presented vs no 73 vs 73 (18 to 99) vs (18 to 102) (61 to 82) vs (61 to 82)	0.799
Intranasal management	No intranasal intervention	13.5 (350)	14.5 (34/234)	85.5 (200/234)	15.2 (30/198)	-
	Cautery only	14.2 (369)	10.8 (30/277)	89.2 (247/277)	20.0 (49/245)	0.172
	Non-dissolvable packs	45.6 (1183)	70.5 (793/1125)	29.5 (332/1125)	18.2 (60/330)	0.438
	Rapid Rhino	40.3 (1046)	72.4 (724/1000)	27.6 (276/1000)	20.0 (55/275)	0.192
	Merocel	3.0 (78)	72.1 (49/68)	27.9 (19/68)	5.3 (1/19)	0.968
	Other non-dissolvable	2.3 (59)	35.1 (20/57)	64.9 (37/57)	11.1 (4/36)	0.538
	Dissolvable products	26.7 (692)	28.9 (198/686)	71.1 (488/686)	21.8 (106/486)	0.074
	NasoPore	18.6 (483)	25.3 (121/479)	74.7 (358/479)	21.8 (78/357)	0.096
	Floseal	5.9 (152)	38.4 (58/151)	61.6 (93/151)	24.7 (23/93)	0.060

	Other dissolvable	2.2 (57)	33.9 (19/56)	66.1 (37/56)	13.9 (5/36)	0.910
Non-dissolvable pack by ED	No	55.9 (1470)	28.0 (345/1233)	72.0 (888/1233)	21.3 (187/880)	0.024*
	Yes	44.1 (1158)	65.2 (709/1087)	34.8 (378/1087)	15.3 (58/378)	
Silver nitrate cautery at any time	No	61.2 (1607)	53.2 (760/1428)	46.8 (668/1428)	18.1 (120/664)	-
	Yes (any)	38.8 (1019)	32.8 (292/891)	67.2 (599/891)	21.0 (125/595)	0.203
	Successful	28.5 (747)	26.8 (175/654)	73.2 (479/654)	18.4 (88/477)	0.885
	Unsuccessful	10.3 (269)	49.2 (116/236)	50.8 (120/236)	31.4 (37/118)	0.001*
Recent epistaxis treatment	No	80.0 (2102)	44.2 (826/1868)	55.8 (1042/1868)	17.0 (176/1035)	<0.001*
	Yes	20.0 (525)	50.4 (227/450)	49.6 (223/450)	31.1 (69/222)	
Hypertension	No	41.3 (1071)	39.5 (365/924)	60.5 (559/924)	18.4 (102/554)	0.459
	Yes	58.7 (1521)	49.4 (672/1361)	50.6 (689/1361)	20.1 (138/686)	
Ischaemic heart disease	No	65.9 (1709)	40.2 (607/1511)	59.8 (904/1511)	18.8 (169/898)	0.416
	Yes	34.1 (883)	55.6 (430/774)	44.4 (344/774)	20.8 (71/342)	
Diabetes	No	87.3 (2263)	44.0 (877/1992)	56.0 (1115/1992)	19.3 (214/1109)	0.882
	Yes	12.7 (329)	54.6 (160/293)	45.4 (133/293)	19.8 (26/131)	
Anticoagulation	None	56.8 (1488)	39.3 (512/1304)	60.7 (792/1304)	19.5 (153/786)	-
	Yes (any)	43.2 (1130)	53.6 (539/1005)	46.4 (466/1005)	19.8 (92/464)	0.997
	Yes (in range, no treatment)	31.1 (815)	43.8 (317/724)	56.2 (407/724)	20.2 (82/405)	0.906
	Yes (in range, lowered)	7.8 (203)	79.7 (145/182)	20.3 (37/182)	18.9 (7/37)	0.943

	Yes (above range, no treatment)	1.1 (29)	60.0 (15/25)	40.0 (10/25)	20.0 (2/10)	0.969
	Yes (above range, lowered)	3.2 (83)	83.8 (62/74)	16.2 (12/74)	8.3 (1/12)	0.349
Antiplatelets	None	75.5 (1974)	44.8 (777/1734)	55.2 (957/1734)	18.4 (175/950)	-
	Yes (any)	24.5 (641)	48.1 (276/574)	51.9 (298/574)	23.6 (70/297)	0.043*
	Aspirin (only)	13.2 (345)	46.3 (144/311)	53.7 (167/311)	24.0 (40/167)	0.084
	Clopidogrel (only)	8.1 (213)	51.1 (97/190)	48.9 (93/190)	22.6 (21/93)	0.304
	Aspirin & Clopidogrel	3.2 (83)	47.9 (35/73)	52.1 (38/73)	24.3 (9/37)	0.350
IV Tranexamic acid	No	77.4 (2029)	43.1 (768/1781)	56.9 (1013/1781)	20.5 (206/1006)	0.328
	Yes	22.6 (591)	62.0 (217/350)	38.0 (133/350)	16.7 (22/132)	

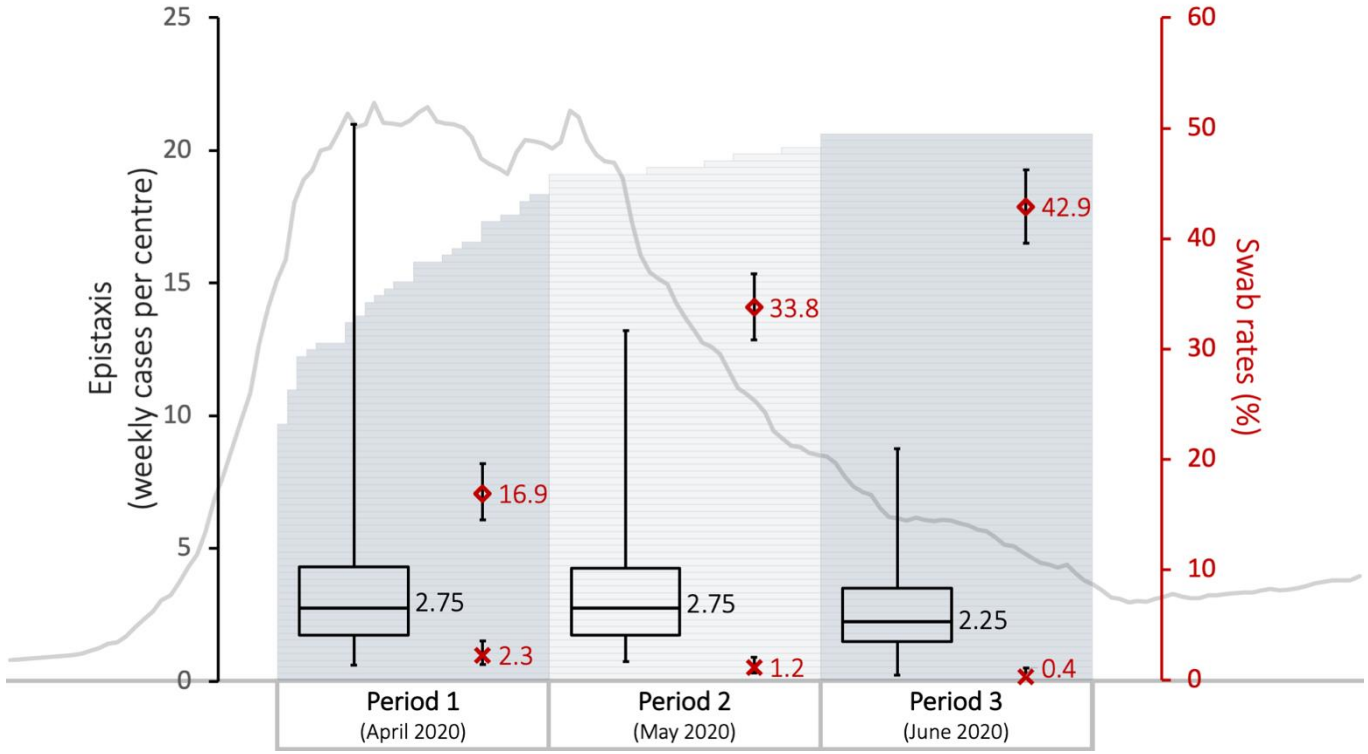
*denotes statistical significance with p value <0.05

Table 2: Intranasal management strategies for ED patients.

Intranasal management	ED management (Can be more than 1) % (n)	Subsequent ENT management (Can be more than 1) % (n)	Final status following ENT review (Definitive intranasal management) % (n)
Overall	(2355)	(2351)	(2322)
No intranasal intervention	**52.3 (1232)**	**32.0 (752)**	**10.1 (234)**
Cautery only	**Data not collected**	**17.7 (417)**	**11.9 (277)**
Non-dissolvable packs	**46.7 (1099)**	**22.1 (520)**	**48.4 (1125)**
Rapid Rhino	40.2 (946)	18.9 (445)	43.1 (1000)
Merocel	5.4 (127)	0.6 (14)	2.9 (68)
Other	1.1 (26)	2.6 (61)	2.5 (57)
Dissolvable products	**2.0 (47)**	**34.7 (816)**	**29.5 (686)**
NasoPore	1.7 (39)	24.4 (573)	20.6 (479)
Floseal	0.1 (3)	7.7 (182)	6.5 (151)
Other	0.2 (5)	2.6 (61)	2.4 (56)

Table 3: Outcomes following re-presentation by intranasal management

Intranasal management	Admission rate after re-presentation % (n)	Packing rate after re-presentation % (n)
Overall	35.1 (86/245)	42.9 (105/245)
No intranasal intervention	**23.3 (7/30)**	**30 (9/30)**
Cautery only	**28.6 (14/49)**	**36.7 (18/49)**
Non-dissolvable packs	**40 (24/60)**	**66.7 (40/60)**
Rapid Rhino	36.4 (20/55)	63.6 (35/55)
Merocel	100 (1/1)	100 (1/1)
Other non-dissolvable	75 (3/4)	100 (4/4)
Dissolvable products	**38.7 (41/106)**	**35.8 (38/106)**
NasoPore	32.1 (25/78)	30.8 (24/78)
Floseal	60.9 (14/23)	47.8 (11/23)
Other dissolvable	40 (2/5)	60 (3/5)



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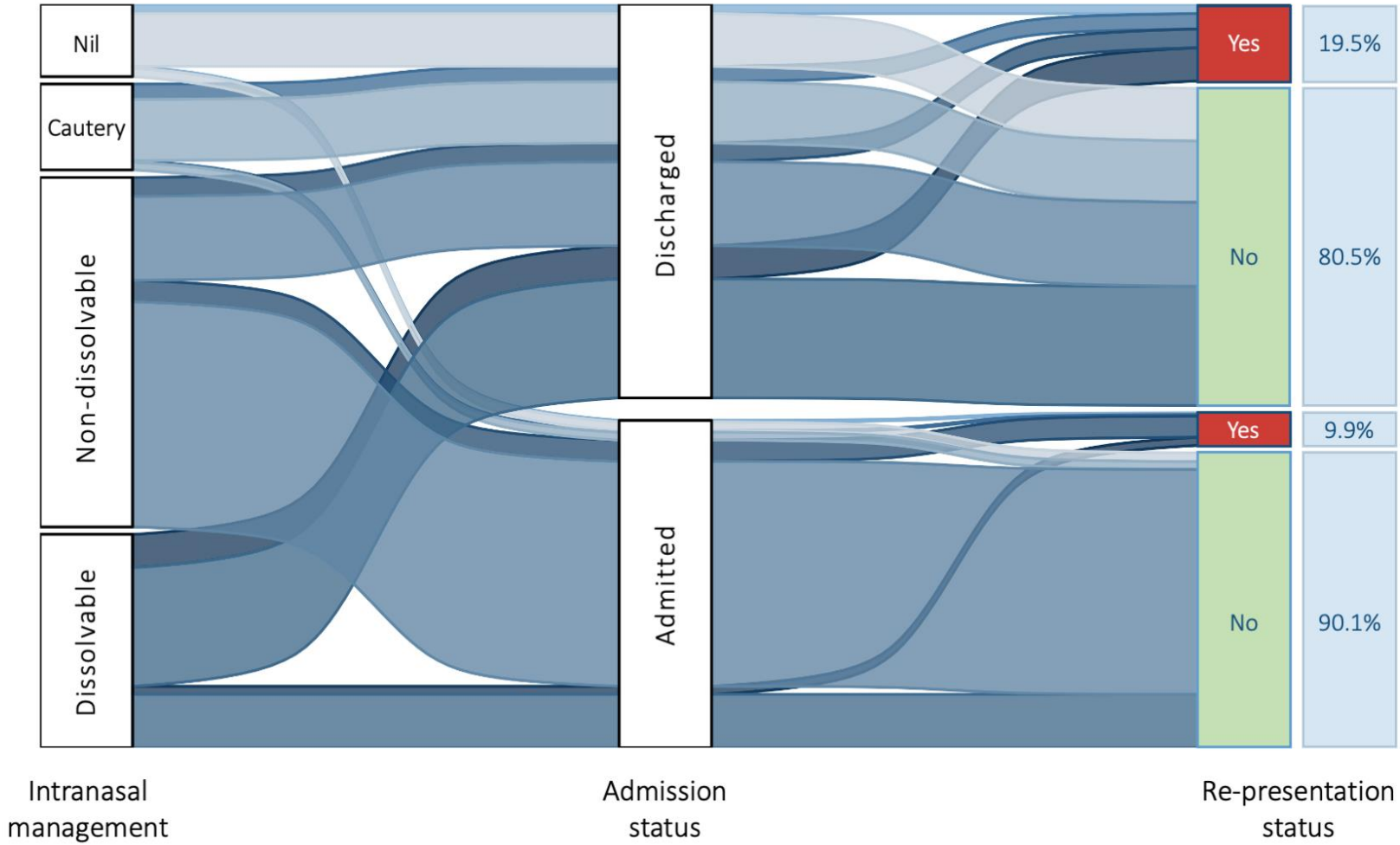

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