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EVALUATION OF GASTROGRAFIN AS ORAL CONTRAST MEDIUM IN ABDOMINOPELVIC CT EXAMINATIONS AMONG ADULT PATIENTS

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ABSTRACT:

Background: Despite advances in CT technology and growing evidence supporting selective rather than routine use, gastrografin continues to be administered as standard practice in many imaging centres, with limited documented evidence on the factors driving this practice, particularly within the Nigerian context. Aim: This study evaluated the use of gastrografin as an oral contrast medium in abdominopelvic CT examinations among adult patients, with specific focus on the factors influencing its routine use, patient tolerance and compliance, and radiographers' perceptions of its clinical usefulness across indications.

Materials and methods: A descriptive cross-sectional design was adopted at Access to Basic Care Foundation (ABC Foundation), Ringroad, Ibadan. Eighty patients were selected using the Taro Yamane formula, while all six radiographers at the facility who met the eligibility criteria were included through total enumeration (census) sampling. Data were collected using two semi-structured, Likert-scale questionnaires and analyzed using descriptive statistics and Spearman's rank correlation.

Results: Clinical indication emerged as the strongest factor influencing routine use, with unanimous strong agreement among radiographers (100.0%), followed by departmental protocol (66.7%) and time constraints. Patient tolerance was generally favourable, with 98.8% completing the required contrast volume and 87.5% willing to repeat the procedure, though taste remained the most common difficulty. Gastrografin was rated most useful for bowel obstruction and post-operative evaluation (mean = 5.00) and least useful for oncology staging (mean = 3.83). A statistically significant inverse relationship was found between perceived administration challenges and frequency of routine use ($r_s = -0.880$, $p = 0.021$), though this finding warrants cautious interpretation given the small radiographer sample.

Conclusion: Gastrografin retains genuine clinical value but is best applied selectively according to indication rather than as routine practice. Its consistent use in daily practice is shaped as much by practical and logistical factors as by clinical necessity. Indication-

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specific protocols, strengthened staff training, and further multi-centre research are recommended to validate and extend these findings.

Keywords: *Abdominopelvic CT, gastrografin, oral contrast medium, patient tolerance, radiographer perception.*

INTRODUCTION

Contrast media are substances administered to improve the visibility of anatomical structures and pathological processes during imaging. In CT, contrast agents may be given intravenously, orally, or rectally depending on the clinical indication. Oral contrast media are specifically used to opacify the gastrointestinal tract, making it easier to distinguish bowel loops from adjacent organs and pathological lesions. Adequate bowel opacification assists radiologists in accurately identifying abnormalities such as bowel perforation, inflammatory bowel disease, intra-abdominal abscesses, fistulas, and abdominal masses [1].

For many years, positive oral contrast agents such as barium sulphate and water-soluble iodinated agents have been widely used during abdominopelvic CT examinations. Gastrografin, a water-soluble iodinated contrast medium containing sodium amidotrizoate and meglumine amidotrizoate, has become one of the most commonly used oral contrast agents in clinical practice. Its radiopaque nature enables clear visualization of the gastrointestinal tract, while its water-soluble properties make it particularly useful in patients with suspected gastrointestinal perforation, bowel obstruction, or postoperative anastomotic leaks, where the use of barium sulphate may be contraindicated [2].

Apart from its diagnostic value, gastrografin possesses a high osmolarity that allows it to draw fluid into the intestinal lumen, thereby stimulating bowel motility. This characteristic has made it useful not only as a contrast medium but also as an adjunct in the conservative management of adhesive small bowel obstruction. Consequently, gastrografin serves both diagnostic and therapeutic purposes in selected clinical situations [3].

Despite these advantages, the routine use of oral gastrografin in abdominopelvic CT remains controversial. With the development of multidetector CT scanners, faster image acquisition, thinner slice thickness, and improved spatial resolution, some researchers

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argue that routine administration of oral contrast may no longer be necessary for many abdominal CT examinations, especially in emergency settings. Others maintain that positive oral contrast continues to improve diagnostic confidence by clearly outlining bowel loops and reducing diagnostic uncertainty in complex abdominal pathology.

The administration of gastrografin is also associated with certain limitations. Patients often complain of its unpleasant taste, which may reduce compliance. Oral contrast administration may prolong examination time because patients must wait for adequate bowel opacification before scanning. In addition, because gastrografin is highly hyperosmolar, it should be used cautiously in dehydrated patients and in individuals at risk of aspiration, as aspiration may result in serious pulmonary complications. Allergic reactions, although uncommon, may also occur in susceptible individuals.These factors emphasize the need to evaluate whether the diagnostic benefits of gastrografin outweigh its potential disadvantages in routine clinical practice.

In Nigeria, the utilization of CT imaging has increased considerably due to improvements in healthcare infrastructure and the growing availability of multidetector CT scanners. However, there is still variation in oral contrast protocols among hospitals and diagnostic centres. While some institutions routinely administer gastrografin before all abdominopelvic CT examinations, others reserve its use for selected clinical indications based on departmental protocols and the preference of the radiologist. This inconsistency suggests the need for evidence-based evaluation of its effectiveness within the local healthcare setting.

Therefore, this study seeks to evaluate gastrografin as an oral contrast medium in abdominopelvic CT examinations by examining the factors that influence its routine use, the extent of patient tolerance and compliance during administration, and radiographers' perceptions of its usefulness across clinical indications. The findings of this study are expected to contribute to the optimization of CT imaging protocols, enhance patient care, and provide useful evidence for radiographers, radiologists, and other healthcare professionals involved in CT practice.

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MATERIALS AND METHODS:

3.1 Research Design

A descriptive cross-sectional design was adopted in this study. In practical terms, all data were gathered at a single point in time with the aim of describing and understanding how gastrografin is currently used as an oral contrast medium in abdominopelvic CT examinations. No variables were manipulated or controlled, and no intervention of any kind was introduced.

3.2 Study Area

The study was conducted at Access to Basic Medical Care Foundation, Ringroad, Ibadan, a private diagnostic centre that carries out approximately 70 abdominopelvic CT examinations per month and routinely incorporates oral gastrografin into its contrast protocol.

3.3 Study Population

The study population is made up of two distinct groups, each serving a different purpose within the overall design.

Group 1: Adult Patients

This group comprises all adult patients aged 18 years and above who attend the main study centre for abdominopelvic CT with oral Gastrografin during the data collection period.

Group 2: Radiographers

This group consists of radiographers actively working in ABC foundation, Ringroad, Ibadan CT unit who have direct, hands-on experience with the administration of oral gastrografin for abdominopelvic examinations.

3.4 Sample Size Determination

The required sample size for each group was calculated independently using the Taro Yamane formula for finite populations:

$$n = N / [1 + N (e)^2]$$

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Where n is the required sample size, N is the total population size, and e is the margin of error, set at 0.05 (5%).

Sample Size for Radiographers

A total enumeration (census) sampling technique was used for this group. All six radiographers at the study centre who are directly involved in abdominopelvic CT examinations and the administration of gastrografin met the eligibility criteria and was included in the study; this group therefore represents the entire accessible population of qualifying radiographers at the facility, rather than a sample drawn from a larger pool.

Sample Size for Adult Patients

Patient data was collected over three weeks. Departmental records indicate that approximately 100 adult patients are expected to undergo abdominopelvic CT with oral Gastrografin at the main study centre within this timeframe. Using the Taro Yamane formula:

$n = 100 / [1 + 100(0.05)^2] = 100 / [1 + 0.25] = 100 / 1.25 = 80$

A required sample of 80 adult patients is therefore indicated. Given that the anticipated total patient population over the three-week period is 100, recruiting 80 participants is achievable within the designated period without any need to extend data collection or relax the inclusion criteria.

Table 3.1: Summary of Sample Sizes

Participant Group	Target Sample Size	Justification
Radiographers	6	Total enumeration (census)
Adult Patients	80	Direct application of Taro Yamane formula (N=100 over 3 weeks)

3.5 Sampling Technique

Patients

Consecutive sampling was used to recruit adult patients. Every eligible patient presenting for abdominopelvic CT with oral gastrografin at the main study centre during the 3-weeks period were invited to take part, provided they satisfy the inclusion criteria. Recruitment

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continues until the target of 80 patients is met. This approach is appropriate because it is straightforward, minimises selection bias, and ensures that the sample is representative of all eligible attendees within the defined timeframe, without requiring randomisation.

Radiographers

Total enumeration (census) sampling was used to select radiographers. This technique involves including every member of the accessible population who meets the eligibility criteria, rather than drawing a smaller sample from a larger pool. All six radiographers at the study centre who possess the required professional experience namely, working experience with the administration of oral gastrografin in CT and active participation in abdominopelvic examinations were therefore included in the study. Because this group constitutes the entire eligible population at the facility rather than a subset of a larger one, no further sampling procedure, such as random or purposive selection, was required.

3.6 Inclusion and Exclusion Criteria

For Adult Patients

Inclusion Criteria:

1. Aged 18 years or above
2. Scheduled for an abdominopelvic CT examination
3. Prescribed oral gastrografin as part of the standard departmental protocol
4. Conscious and capable of providing informed consent
5. Willing to participate voluntarily

Exclusion Criteria:

1. Aged below 18 years (paediatric patients)
2. Unable to ingest oral contrast due to vomiting, suspected bowel obstruction, or reduced consciousness
3. Known hypersensitivity to iodinated contrast media, as documented in the medical record

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4. Refusal to provide informed consent

For Radiographers

Inclusion Criteria:

1. Currently employed as a radiographer in a CT unit
2. Has administered or supervised the administration of oral gastrografin for at least one abdominopelvic CT examination within the preceding 12 months
3. Willing to complete the questionnaire

Exclusion Criteria:

1. No previous experience with oral gastrografin
2. Works exclusively in other imaging modalities (e.g., plain radiography, MRI, or ultrasound) with no CT involvement
3. Declines to participate or submits an incomplete questionnaire

3.7 Research Instruments

Two semi-structured, self-administered questionnaires served as the primary data collection instruments. Each has been developed specifically for one of the two participant groups.

3.7.1 Patient Tolerance and Compliance Questionnaire

This questionnaire was used to gather data from adult patients undergoing abdominopelvic CT with oral gastrografin. It is organised into three sections.

Section A: Demographic and Clinical Information:This section captures each patient's age, sex, clinical indication for the scan, and pertinent medical history, such as prior abdominal surgery or a known bowel disorder.

Section B: Tolerance to oral gastrografin:This section assesses the patient's experience following ingestion of the diluted gastrografin solution. Questions address the presence and severity of symptoms including nausea, vomiting, bloating, abdominal cramping, and

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diarrhoea. Responses will be recorded on a simple four-point Likert scale: none, mild, moderate, and severe.

Section C: Compliance:This section records whether the patient consumed the full prescribed volume of the solution. Where the patient did not finish the preparation, the reason will be documented (for example, unpleasant taste, nausea, a feeling of fullness, or vomiting). The time taken to drink the solution will also be noted.

The questionnaire was written in English, the three most accessible languages (Hausa, Igbo,Yoruba) in Nigeria. It was administered face-to-face by the researchers immediately after the patient has finished drinking the contrast preparation and before the CT scan begins.

3.7.2 Radiographer Perception Survey

A separate structured questionnaire was designed for radiographers. This survey explores their perceptions, experiences, and current practices in relation to oral gastrografin in abdominopelvic CT. It comprises four sections.

Section A: Demographic and Professional Information:

This section collects the radiographer's age, sex, years of experience in CT, and type of facility where they currently work.

Section B: Factors influencing routine use:

This section investigates the practical, institutional, and clinical factors that influence whether gastrografin, plain water, or no oral contrast is selected for a given examination. Questions cover protocol availability, referring clinician preferences, departmental guidelines, cost considerations, and scanner type.

Section C: Perceived usefulness across clinical indications:

Radiographers was presented with a list of common abdominopelvic indications—including trauma, suspected bowel obstruction, post-operative abscess, cancer staging, and inflammatory bowel disease and asked to rate the usefulness of gastrografin for each on a three-point scale: not useful, somewhat useful, and very useful.

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Section D: Challenges and recommendations:

Open-ended questions in this final section give radiographers the opportunity to describe difficulties they have encountered such as patient refusal, adverse reactions, or logistical constraints and to suggest improvements to current practice.

The survey was distributed using both hard copy and electronic forms via Google Forms, depending on the preference of each participating radiographer.

3.7.3 Validity and reliability of instruments

Content and face validity of both questionnaires were established through review by experts, who assessed each item for clarity, relevance to the study objectives, and appropriateness for the target respondents. Items identified as ambiguous, redundant, or irrelevant were revised in response to this feedback prior to administration.

3. 8 Method of data collection

Data collection took place over three weeks proceeded along two parallel tracks

3.8.1 Patient data collection

At the main study centre, all adult patients scheduled for abdominopelvic CT with oral gastrografin was screened against the inclusion and exclusion criteria as they arrive for their appointment. Eligible patients were approached consecutively on the day of their scan, before it takes place.

The following steps were followed for each participant:

1. Explanation and consent: A radiographer or trained research assistant provided a clear explanation of the study, its voluntary nature, and what participation will involve. Written informed consent will be obtained from all who agree to take part.

2. Administration of oral gastrografin: The patient ingested the standard departmental preparation 10 mL of concentrated gastrografin diluted in approximately 500 mL of water (or as per the centre's established routine). No modification will be made to the standard clinical protocol.

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3. Questionnaire administration: Immediately after the patient has finished drinking the contrast and before the CT scan begins, the Patient Tolerance and Compliance Questionnaire will be administered face-to-face. This will capture any symptoms experienced, whether the full volume was consumed, the reason for incomplete consumption if applicable, and relevant demographic and clinical details.

4. CT scanning: The patient proceeded to the CT examination according to the standard clinical protocol. No scan data will be collected for research purposes; only questionnaire responses will be retained.

5. Data recording: Completed questionnaires was assigned a unique participant code and stored securely in a locked cabinet for paper copies, or in a password-protected digital folder for electronic entries. No personally identifying information, such as the patient's name or hospital number, will be retained.

Recruitment continued until 80 patients have been enrolled. Given that approximately 100 eligible patients are expected over the three-week period, this target should be achievable without difficulty.

3.8.2 Radiographer data collection

All six radiographers who meet the eligibility criteria at ABC Foundation, Ringroad, Ibadan was invited to participate, consistent with the total enumeration approach described in Section 3.5. The following steps will guide this process:

1. Identification of eligible radiographers: A list of all CT radiographers at ABC Foundation who meet the eligibility criteria was compiled with the assistance of the departmental head.

2. Distribution of questionnaires: The Radiographer Perception Survey was distributed either in hard copy hand-delivered to radiographers at their workplaces—or electronically through a secure platform such as Google Forms. A cover letter explaining the study and stating that completion and return of the questionnaire constitutes implied consent will accompany each copy.

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3. Follow-up: One reminder was sent by email or in person approximately two weeks after initial distribution to those who have not yet responded.

4. Collection: A hard copy questionnaire was collected in sealed envelopes. Electronic responses will be stored automatically in a secure online database.

5. Data handling: All responses were fully anonymised. No identifying information, including names or specific workplace details, will be reported in the final study.

A total of 6 completed radiographer questionnaires were sought. The 3-weeks collection window is considered sufficient to reach this target.

3.8.3 Data Storage and Confidentiality

All data was stored securely throughout the study. Paper questionnaires were kept in a locked cabinet accessible only to members of the research team. Electronic data was held in password-protected files. No raw data was shared with any third party. Upon completion of the study, all data was retained for an appropriate period before being securely destroyed.

3.9 Method of Data Analysis

All completed questionnaire was first checked for completeness before the data are entered into a spreadsheet for analysis. The analysis proceeded in two stages.

In the first stage, descriptive statistics was used to summarise the findings. Simple counts, percentages, and measures of central tendency will describe patient tolerance and compliance, radiographers' views on the usefulness of gastrografin, and the factors that influence its routine use. This provided a clear and accessible picture of current practice.

In the second stage, the data were examined for associations and correlations between variables. For example, the analysis will explore whether patient age, sex, or clinical indication is linked to differences in tolerance; whether the ability to consume the full contrast volume is associated with particular symptoms such as nausea or bloating; and whether more experienced radiographers hold different views about the clinical value of gastrografin compared with their less experienced colleagues.Where appropriate, simple cross-tabulations wereconstructed and any noteworthy patterns or relationships was

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highlighted. The emphasis throughout wad describing the data clearly and meaningfully rather than on applying complex statistical methods. All findings will be presented using tables, charts, and plain-language summaries.

3.10 Ethical Considerations

Ethical clearance was obtained from the Research Ethics Committee (REC) of Lead City University, Ibadan, prior to the commencement of data collection. In addition, formal permission was sought from the management of Access to Basic Care Foundation, the primary data collection site. For other facilities contributing radiographer participants, written or verbal approval was secured from the relevant head of Department or facility manager before any questionnaire is distributed. Written informed consent wad obtained from every adult patient prior to data collection. Patients will be given a full explanation of the study, including its purpose, what participation involves, and the fact that involvement is entirely voluntary. They were also informed that choosing not to participate or withdrawing at any stage will have no bearing whatsoever on their clinical care or the conduct of their CT scan. A separate consent form will document each patient's agreement. For radiographers, the act of completing and returning the questionnaire constituted implied consent. The accompanying cover letter stated clearly and confirmed that non-participation carries no professional consequences.

Confidentiality and Anonymity

All data collected was treated as strictly confidential. Questionnaires were identified by unique participant codes only; no names, hospital numbers, or other identifying details that appears on any research document. Patient anonymity was guaranteed by design, as no personally identifiable information was recorded. Radiographer responses were similarly be anonymous: no names or specific workplace details were collected or included in any report. Access to raw data was restricted to the research team.

Voluntary participation

Participation in this study was entirely voluntary. Both patients and radiographers were free to decline to participate or to withdraw at any point without providing a reason and

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without facing any negative consequence. For patients, withdrawal will in no way affect the quality of their examination or any other aspect of their medical care.

RESULTS

Table 1 presents the demographic characteristics of the six radiographers. The majority (50.0%) were aged 30 - 39 years, with equal sex distribution (50.0% male, 50.0% female). Most held a BSc in Radiography (66.7%). Working experience was spread across categories, with 50.0% having 5--10 years. Concerning routine use, 66.7% reported routine use, 33.3% occasional use, and none reported complete non-use.

Table 2 summarises the 80 patients. The 40 - 59 years bracket comprised 40.0%, females 56.2%, and secondary-educated respondents 43.8%. Most (72.5%) had no prior CT with oral contrast.

Table 3 shows that clinical indication dominated (100.0% strongly agreed, mean = 5.00). Departmental protocol followed (66.7% strongly agreed, mean = 4.67). Radiologists' preference and patient-related factors both scored 4.33. Time constraints registered 4.17. Availability/cost and staff training scored 3.67, while lack of referring-clinician awareness was lowest at 3.33.

Table 4 shows 98.8% completed the volume (mean = 4.28). Taste tolerability was moderate (mean = 3.75). Discomfort was low (mean = 1.92; 81.2% reported none). Information provision scored 3.82. Willingness to repeat was high (87.5%; mean = 4.32). Waiting time reasonableness scored 4.24. Overall satisfaction was 80.0% (mean = 3.98).

Table 5 presents patient challenges. Volume was considered excessive by 66.3% (mean = 3.42). Taste/smell difficulty was acknowledged by 75.0% (mean = 3.72). Side effects prompting cessation were low (13.7%; mean = 2.10). Inadequate time was cited by 13.7% (mean = 2.26). Lack of guidance was noted by 17.6% (mean = 2.48). Challenges affecting willingness to repeat attracted 35.0% agreement (mean = 2.91).

Table 6 shows cross-tabulations. Age vs satisfaction was non-significant ($p = 0.441$). Previous CT vs willingness was non-significant ($p = 0.764$). Sex vs discomfort was significant ($p = 0.019$): 20.0% of males vs 2.2% of females reported discomfort. Education vs drink ability was non-significant ($p = 0.526$).

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Table 7 shows unanimous strong agreement for bowel obstruction and post-operative evaluation (mean = 5.00 each). Bowel opacification and perforation both scored 4.67. Oncology staging was more guarded (3.83). Minimal trauma value was endorsed by all (4.33). Choice justification scored 3.67. Overall quality enhancement scored 4.50.

4 DISCUSSIONS

The radiographer demographic profile revealed a mid-career workforce with no facility reporting complete gastrografin discontinuation. This suggests the agent retains a recognised, if selective, role in contemporary practice, consistent with the broader shift toward indication-based rather than blanket use documented in recent literature [1].

For research question one, clinical indication emerged as the dominant factor (100.0% strong agreement), consistent with Matos and Macari's argument that positive oral contrast should be reserved for situations offering a genuine diagnostic advantage rather than applied across the board [2]. Departmental protocol and radiologist preference also ranked highly, reflecting institutional culture and specialist judgment rather than a purely individual decision. The moderate agreement on time constraints (mean = 4.17, with 83.3% agreeing or strongly agreeing) corroborates a broader trend in which water and neutral oral contrast agents are increasingly favoured for routine scans, since they perform comparably to gastrografin for most abdominal structures while being faster and easier on department workflow [3].

This preference for indication-driven use should, however, is read against evidence that water alone can match gastrografin's diagnostic performance in many routine scenarios. De Wit and colleagues, comparing water-only against positive-oral-contrast protocols prospectively, reported broadly similar diagnostic outcomes between the two approaches [9]. Taken together with the present finding that time pressure genuinely discourages routine use, this raises the possibility that at least some current gastrografin use could be shifted to a faster, better-tolerated alternative without a meaningful loss of diagnostic value, a question this study was not designed to test directly, but one the data leave open for future work.

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For research question two, patient tolerance was generally favourable. The 98.8% volume-completion rate supports the position that most patients physically manage the preparation when properly instructed, and the high willingness to repeat the examination (87.5%) suggests this tolerance is not merely superficial compliance under pressure. However, the taste tolerability mean of 3.75 indicates room for improvement, consistent with head-to-head comparisons showing gastrografin is rated less palatable than other oral iodinated contrast media [4]. The low discomfort rate (10.0%) aligns with evidence that diluted preparations are generally better tolerated than full-strength ones [5], suggesting that formulation choices, not just patient counselling, could meaningfully improve the overall experience. The significant sex-discomfort association ($p = 0.019$) is noteworthy but requires real caution: with only 8 patients reporting discomfort in total, a single skewed subgroup could be driving the result, and the finding is best treated as a hypothesis for future study rather than an established pattern.

For research question three, unanimous strong agreement on bowel obstruction and post-operative evaluation (mean = 5.00) reflects established value. Randomised comparison of diluted gastrografin against water has demonstrated real advantages for gastrografin in bowel opacification, supporting its continued use in obstruction and related indications [6]. In post-operative patients, it remains valuable for detecting anastomotic leaks, an application highlighted among the least controversial indications for positive oral contrast [2]. The lower oncology score (3.83) runs somewhat against evidence of added diagnostic value from oral contrast in colorectal cancer staging [7], and more likely reflects how staging practice has evolved, with intravenous contrast and higher-resolution scanners reducing dependence on bowel opacification. Read alongside the research question one finding, this pattern suggests that radiographers in this study are not applying gastrografin uniformly out of habit, but are making relatively fine-grained distinctions between indications where its value remains well established and indications where its role has narrowed over time.

The hypothesis result supports the proposition that practical challenges constrain routine adoption. The strong negative correlation ($r_s = -0.880$) implies departments perceiving greater barriers inadequate time, patient refusal, cost are less likely to use gastrografin as standard protocol. This adds a quantitative dimension to observations elsewhere that

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practical, non-clinical factors can discourage routine use even where oral contrast is otherwise indicated.8 It suggests that while guidelines may recommend gastrografin for specific indications, frontline implementation depends on whether radiographers believe logistical demands are manageable within workflow constraints. This result should, however, be interpreted with real caution: it is based on only six radiographers, and a correlation this strong from so small a sample could shift considerably with even one or two additional respondents. It is best read as a suggestive, hypothesis-generating finding rather than a settled conclusion, and the recommendation for a larger, multi-centre sample later in this study follows directly from this limitation.

CONCLUSION

The findings allow for a few clear conclusions to be drawn. First, gastrografin still has real clinical value, but it works best when its use is guided by specific indications rather than given to every patient as a matter of routine. The radiographers in this study showed a good understanding of when it should be used, such as for bowel obstruction, leaks after surgery, perforation, and abscesses, and when it should be avoided, especially in trauma cases and active bleeding.

Most patients tolerate and complete the contrast without major problems. They finish the required amount, feel reasonably satisfied, and are willing to take it again. This taste problem does not stop most patients from completing the exam, but it is the one area where the biggest improvement could be made.

Routine use is held back by practical issues that go beyond clinical judgment. Time pressure, patients refusing the drink, not enough time for the contrast to move through the bowel, and cost all add up to reduce how often it is used routinely. The strong negative correlation found in this study confirms that these logistical problems have a real and measurable effect on practice, separate from whether the contrast is clinically needed.

Overall, gastrografin still has an important but specific role in CT scans of the abdomen and pelvis today. It remains necessary for certain situations where seeing the bowel clearly with contrast gives information that cannot be obtained any other way. However, moving from what the guidelines recommend to what actually happens in daily practice depends on how departments are run, what resources are available, and how well patients tolerate the

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drink, and these are the areas that need attention if gastrografin is to be used to its full potential.

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Table 1: Demographic characteristics of Radiographer as respondents (n = 6)

Variable	Category	Frequency	%
Age	20 - 29	0	0.0
	30 - 39	3	50.0
	40 - 49	2	33.3
	50 and above	1	16.7
Sex	Male	3	50.0

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	Female	3	50.0
Qualification	RRBT	1	16.7
	BSc Radiography	4	66.7
	MSc/MPH	1	16.7
Experience	Less than 5 years	1	16.7
	5 - 10 years	3	50.0
	11 - 15 years	1	16.7
	Above 15 years	1	16.7
Routine Use	Yes	4	66.7
	No	0	0.0
	Sometimes	2	33.3

Table 2: Demographic characteristics of patient as respondents (n = 80)

Variable	Category	Frequency	%
Age	20--39	28	35.0
	40--59	32	40.0
	60 and above	20	25.0
Sex	Male	35	43.8
	Female	45	56.2
Education	No formal education	8	10.0
	Primary	12	15.0
	Secondary	35	43.8
	Tertiary	25	31.2
Previous CT with Oral Contrast	Yes	22	27.5
	No	58	72.5

Table 3: Factors influencing routine use (n = 6)

S/N	Statement	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean
1	Availability and cost	0 (0.0)	4 (66.7)	2 (33.3)	0 (0.0)	0 (0.0)	3.67
2	Departmental protocol	4 (66.7)	2 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	4.67
3	Clinical indication	6 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5.00
4	Radiologists' preference	3 (50.0)	2 (33.3)	1 (16.7)	0 (0.0)	0 (0.0)	4.33
5	Time constraints	2 (33.3)	3 (50.0)	1 (16.7)	0 (0.0)	0 (0.0)	4.17
6	Patient-related factors	2 (33.3)	4 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)	4.33
7	Staff training	0 (0.0)	4 (66.7)	2 (33.3)	0 (0.0)	0 (0.0)	3.67
8	Lack of awareness	0 (0.0)	2 (33.3)	4 (66.7)	0 (0.0)	0 (0.0)	3.33

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Table 4: Patient tolerance and compliance (n = 80)

S/N	Statement	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean
1	Able to drink volume	24 (30.0)	55 (68.8)	0 (0.0)	1 (1.2)	0 (0.0)	4.28
2	Taste tolerable	17 (21.2)	39 (48.8)	11 (13.8)	13 (16.2)	0 (0.0)	3.75
3	Experienced discomfort	3 (3.8)	5 (6.2)	7 (8.8)	33 (41.2)	32 (40.0)	1.92
4	Felt informed	19 (23.8)	40 (50.0)	9 (11.2)	12 (15.0)	0 (0.0)	3.82
5	Willing to repeat	39 (48.8)	31 (38.8)	8 (10.0)	1 (1.2)	1 (1.2)	4.32
6	Waiting time reasonable	32 (40.0)	39 (48.8)	5 (6.2)	4 (5.0)	0 (0.0)	4.24
7	Overall satisfaction	18 (22.5)	46 (57.5)	12 (15.0)	4 (5.0)	0 (0.0)	3.98

Table 5: Patient challenges (n = 80)

S/N	Statement	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean
1	Volume too much	7 (8.8)	46 (57.5)	10 (12.5)	8 (10.0)	9 (11.2)	3.42
2	Taste/smell difficult	10 (12.5)	50 (62.5)	9 (11.2)	10 (12.5)	1 (1.2)	3.72
3	Side effects made stop	2 (2.5)	9 (11.2)	6 (7.5)	41 (51.2)	22 (27.5)	2.10
4	Not enough time	5 (6.2)	6 (7.5)	12 (15.0)	39 (48.8)	18 (22.5)	2.26
5	Not enough guidance	3 (3.8)	11 (13.8)	21 (26.2)	31 (38.8)	14 (17.5)	2.48
6	Challenges affect willingness	11 (13.8)	17 (21.2)	18 (22.5)	22 (27.5)	12 (15.0)	2.91

Table 6: Demographic cross-tabulations

Variable	Outcome	n	%	Test	p-value
Age	Satisfied	64	80.0	$Chi^2 = 3.751$	0.441
	Neutral	12	15.0		
	Dissatisfied	4	5.0		
Previous CT	Willing	70	87.5	$Chi^2 = 0.537$	0.764
	Uncertain	8	10.0		
	Unwilling	2	2.5		
Sex	Discomfort (Yes)	8	10.0	$Chi^2 = 7.963$	0.019*
	Discomfort (No)	65	81.2		
Education	Able	79	98.8	$Chi^2 = 2.228$	0.526

*Significant at $p < 0.05$

Table 7: Radiographers' perception of usefulness (n = 6)

S/N	Statement	SA(%)	A(%)	U(%)	D(%)	SD (%)	Mean
1	Improves opacification	4 (66.7)	2 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	4.67
2	Bowel obstruction	6 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5.00
3	GI perforation	4 (66.7)	2 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	4.67
4	Oncology staging	0 (0.0)	5 (83.3)	1 (16.7)	0 (0.0)	0 (0.0)	3.83
5	Post-operative	6 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5.00

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6	Minimal trauma value	2 (33.3)	4 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)	4.33
7	Choice justified	0 (0.0)	4 (66.7)	2 (33.3)	0 (0.0)	0 (0.0)	3.67
8	Overall quality	3 (50.0)	3 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	4.50

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