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Original article

Impact of admission to high-risk isolation room on patients' and healthcare workers' perceptions: A qualitative cross-assessment Approach

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ABSTRACT

Introduction. – High-risk isolation units (HRIU) house patients at high risk of transmitting infectious agents, notably patients with suspected viral hemorrhagic fever or smear-positive tuberculosis. Admission to HRIU can alter the quality of care and impact patients' and healthcare workers' (HCWs) anxiety and dissatisfaction.

Methods. – The Infectious Diseases Department of the Bichat Claude Bernard Hospital in Paris houses a 7-bed HRIU. We conducted a qualitative study based on individual semi-structured interviews to assess the perceptions of both patients and HCWs.

Results. – We interviewed 14 patients and 16 HCWs routinely working in the HRIU. All 8 patients subject to isolation precautions and 1 of the 6 patients not subject to isolation precautions expressed a negative representation of the room with a feeling of confinement, stigma, and mistrust. They also reported a lack of information from healthcare staff and a need for entertainment, activities, and visits from relatives. HCWs did not like working in this unit because of the anteroom's technical constraints and a loss of frequent contact with patients. They also expressed a feeling of insecurity working in these units despite the use of interphones.

Conclusion. – Placing patients in an HRIU not only affects their emotions, but also impacts HCWs both emotionally and organizationally. Alert systems, intercoms, and videoconferencing systems can improve safety and security as well as exchanges with patients and their relatives. Psychological support is needed for patients who are subject to isolation precautions and for their attending HCWs.

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1. Introduction

High-risk isolation rooms (HRIR) are designed to protect patients from being contaminated by external microorganisms or to avoid transmitting high-risk pathogens to other patients and healthcare workers (HCWs). They usually include an anteroom with self-closing doors and doors under remote control. These can maintain positive or negative air pressure in the isolation room according to the objective.

HRIRs with positive pressure are used routinely for patients in protective isolation who are at high risk of infection, especially those with prolonged neutropenia. Conversely, HRIRs with negative pressure are for patients with a high risk of transmitting infection, such as those with smear-positive tuberculosis, suspected or proven highly pathogenic infectious diseases such as viral hemorrhagic fever (VHF) or infection due to Middle East Respiratory Syndrome Coronavirus (MERS-CoV).

The use of transmission-based precautions changes the quality and safety of patient care. Studies of patients' perceptions during the isolation period after stem-cell transplantation [1–3] or during contact precautions for colonization with multidrug-resistant microorganisms (MDROs) [4] indicate significant psychological distress and depression. However, depression in this situation seems to be a preexisting condition, rather than induced by precautions

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Table 1
Characteristics of patients admitted to the isolation unit.

Age (year)	Diagnosis	Duration of stay (days)	Precautions	Date of interview after admission to the HRIR	Duration of the interview (min)
54	Resistant tuberculosis	49	Airborne	30	26
44	Resistant tuberculosis	20	Airborne	15	18
39	Acute pancreatitis	11	Contact (HDRMO)	10	31
48	Bacteremia	4	Contact (HDRMO)	3	22
57	Lung cancer	58	Contact (HDRMO)	40	17
38	Tuberculosis	3	Airborne	2	35
76	Endocarditis	69	Contact (HDRMO)	6	25
41	Tuberculosis	25	Airborne	4	35
66	Urinary tract infection	6	No	5	46
83	Endocarditis	18	No	18	10
52	Complicated AIDS	9	No	8	18
68	Pulmonary infection	53	No	3	33
67	Cutaneous infection	9	No	3	29
44	Prosthetic joint infection	12	No	3	20

HDRMO: highly drug-resistant microorganism.

[5–8]. In addition, general recommendations in these situations rarely address the questions of patient anxiety and depression or their prevention [9,10].

The Bichat–Claude Bernard Hospital is a referral center in France for the care of patients suspected of presenting high-risk (HR) infection, such as VHF or infection due to MERS-CoV. Apart from HR infection, its 7-bed isolation unit routinely houses patients with other infections, such as those carrying highly drug-resistant microorganisms or smear-positive tuberculosis.

We assessed the perceptions of patients housed in HRIRs and their HCWs regarding quality of care, safety and anxiety.

2. Methods

The 7-bed isolation unit of the Bichat Claude Bernard Hospital in Paris is part of the Infectious Diseases Department. Bedrooms include two anterooms, one for entering and the other for exiting the room. The surface areas of the anterooms and rooms are 4–8 m² and 15–19 m², respectively. The revolving door between the anteroom and the room includes glass windows, allowing surveillance from outside the room, whereas the revolving doors between the corridor and the anteroom are solid. All rooms, anterooms and the care station are equipped with interphones. One larger room (19 m²) with video cameras is equipped to house a patient with severe VHF and perform intensive care.

From February to July 2018, we asked all patients admitted to the HRIU and who stayed for at least 3 days to participate in our study, whatever the reason for admission. Patients with suspected VHF or MERS-CoV were therefore not included, since we received only suspected and not confirmed cases during the study period. These patients stayed for a maximum of 2 days. Patients who volunteered and were able to answer questions in French were included. The reasons for patient admission were collected, including carriage of highly drug-resistant microorganisms, either vancomycin-resistant enterococci or carbapenemase-producing enterobacteriaceae, smear-positive or resistant tuberculosis, or no specific indication for isolation. During the same period, all HCWs routinely caring for patients in the isolation unit were asked to take part in our study.

Volunteer patients and HCWs were questioned using face-to-face individual interviews. All interviews were conducted by a researcher (GB) using a semi-structured interview guide consisting of open-ended questions to explore to the interviewees' experience in the room, including their emotions and moods, if any, during their care and isolation measures. The interviewees were also asked about their overall satisfaction with their stay. We recorded patients' ages, the reason for admission to the HRIU, and the

duration of stay before the interview. We recorded HCWs functions and how long they had been in the department. The questions focused on the organization of the unit around the HRIR and the impact this unit had on patients and HCWs.

All interviews were de-identified and transcribed verbatim. The interviews were analyzed independently by B.G. and J.C.L., using an iterative thematic approach [11,12] resulting in the definition of themes and sub-themes, which yielded an analytic framework then used to compare interviews.

All patients and HCWs signed informed consent prior to the interview. Ethical approval was obtained from the Hôpitaux Universitaires-Paris Nord Val-de-Seine (HUPNVS) ethics committee.

3. Results

3.1. Patients

From February to April 2018, 80 patients were admitted to the HRU, 59 stayed for at least 3 days, 30 were not eligible for inclusion, and 14 agreed to participate (Table 1). The patients' main perceptions are presented in Table 2.

3.1.1. A feeling of imprisonment

All 8 patients with isolation precautions (IP) and 1 of the 6 without such precautions had a negative perception of their time in an HRIR room. The terms “isolated” and “locked up” were cited in all interviews, and “prison” or “prisoner” in 7 interviews. Patients highlighted their impression of imprisonment since they could not leave their rooms and the anteroom limited their desire to leave. “It really demoralized me [to be here] (...) I felt locked up (...) . . . I didn't like it at all. [When entering the room] I had the feeling of being in prison, the way the doors close, the way it's barricaded, it's really a prison . . . (...). After, [when] the person gets better, they should be released quickly. . . .”

3.1.2. A rise in the seriousness and contagiousness of the situation

In discovering the room, patients with IP reported becoming aware of a link between the severity of their illness and the peculiarity of the room “Emotion [arriving]. . . oh boy, I have something really serious!”

Several patients, most with IP, reported that these rooms encouraged self-reflection: “It made me think more, in this room.” Their thoughts centered on illness, its severity and its effects on life: “What am I doing here?”, and was also anxiogenic: “We think . . . we begin to wonder, (...) if I'm seriously ill maybe I'll go home and contaminate people. . . .” “This room raises a lot of questions”.

Table 2
Main perceptions of patients admitted to the isolation unit.

Perception	Patients with isolation precautions	Patient without isolation precautions
Negative representation of the room	8/8	1/6
Sense of imprisonment		
Psychological suffering		
Stigma		
Mistrust		
Positive representation of the room	0/8	5/6
Feeling of security, protection		
Quietness (calm)		
Intimacy, no neighbor		
Perception of a link between the peculiarity of the room and the severity of the illness	7/8	0/6
Introspection induced by the room	7/8	1/6
Perception of a link between duration of hospitalization and psychological suffering	8/8	0/6
Long wait after ringing for assistance	5/8	2/6
Feeling of a lack of information from physicians	6/8	0/6
Good quality of care, satisfactory care	8/8	6/6
Importance of entertainment/activities (television, visits...)	8/8	3/6
Comfort felt in the room (furniture, atmosphere...)	4/8	4/6

To counter boredom, some patients spoke of getting out of the room, but for others with IP going out made their own contagiousness visible to others. Wearing masks outside the room for airborne precautions showed that “we are contagious for others” and was associated with feelings of guilt. These feelings seemed to be present at the beginning of the hospital stay, but did not last: “When they found I had a resistant bacteria, they put a trolley in front of my room with aprons, gloves... and then I felt a little singled out (...) but today it’s okay, I got used to it”; “It’s true that at the beginning it embarrassed me, like I’ve got the plague or something” “or (...) that I’m a leper, an untouchable...”.

3.1.3. A confinement leading to introspection

To counter these feelings of self-doubt, patients emphasized the importance of visits: “I’m in good spirits (...) because my partner visits me, my mother too, my cousins, my friends... I’m not alone, you know. If you’re alone in this room [...], you’ll have dark thoughts!”

All patients with IP and one IP-free patient experienced confinement related psychological distress. Family support for hospitalized patients seemed essential to maintaining emotional balance: “My family is not here (...) and few friends come. You know (...) in Paris, everyone’s busy... I accept that. Phone calls are a [morale] boost (...). People often call, so it’s okay”.

Another issue reported to worsen psychological suffering is hospital stay length: “Being hospitalized for a long, very long time, whoever the person, I’m sure it’ll inevitably lower his morale (...) it’s normal.”

Unlike other patients interviewed, 5 patients without IP felt “very good” in what they saw as an upscale room: “It was amazing when I discovered the department, brand new. I had the impression of arriving in a luxury room (...) it’s welcoming, it doesn’t feel like it’s going to be a difficult stay (...) [the stay] it can only be positive since... the room offers a warm welcome, it’s spacious, colorful,... It inspires rather good vibes”. For these patients, the room also represented protection against outside bacteria: “It’s a protection, a security compared to the outside world. It’s the double doors [that do that]. If you put me in a sterilized room, it’s precautionary”. “It’s very reassuring [to be in this room], that germs from outside can’t get in!”

3.1.4. Perceived lapses in care delivery

The patients were questioned about care quality. All said they were satisfied with the services provided. However, in comparison with other units, patients, mostly with IP, noted a decrease in the number of HCW visits: “There are definite times for the giving of medication... for an infusion, (...) but it disappoints me that... when we call they take a long time to come”. “[In another department], the door was open so they [nurses] arrived spontaneously (...) here with the anteroom they have to call me because they don’t hear the bell ringing”. “It’s a bit long. Elsewhere they arrive immediately”.

3.2. Healthcare workers

3.2.1. Characteristics

Sixteen HCWs were interviewed: 7 nurses, 4 nursing aides, 1 head nurse, 2 senior physicians, 1 resident and 1 psychologist. Interview duration ranged between 20 and 67 min (median, 30 min).

3.3. Lockdown and psychological impact

HCWs rarely cited the positive aspects of the rooms. The few positive remarks referred to the “spacious and comfortable” character of the rooms, “each with its bathroom, and space when the patients have visitors.” The great majority of comments were negative: a “feeling of suffocation” when they are in the isolation rooms, a feeling of confinement and “oppression.” HCWs reported the feeling of “quarantine” felt by patients and most used the words “anxious” and “stressed” to describe the mood of patients in HRIR. For HCWs, these feelings were primarily related to confinement and to the room’s technical characteristics: “Hearing the ventilation (...) the pressure visible [on] the screen, the entrance and exit [to the anteroom]... [they] wonder what’s happening... so for them it increases their anxiety, they say, Why? What do I have? What’s happening to me? It’s stressful...”.

A long hospital stay seemed to affect the patient’s frame of mind: “If a patient stays for 20 days, well, you find them in a catastrophic state (...), they quickly become somewhat depressed. Patients felt “both dirty and sick” with “a body maltreated by a disease [and] something imposed on [their] freedom (...) of movement”. On the other hand, being “alone with oneself” leads to “meditation that is endured”.

3.3.1. Decreasing frequency of visits

HCWs' desire to "get out of the room quickly" resulted in a tendency to minimize their presence, resulting in a deterioration of patient relationships: "Once we are in the room, we just want to provide care and get out. It's rare that I hang around to chat with a patient (...) I admit".

HCWs did not like working in HRIU. They reported a heavier workload due to the technical constraints of the anteroom and time lost since anteroom use changed how caregivers work: all HCWs reported that they "bundle care to save time". HCWs did not "go spontaneously to the isolation rooms, but go there only because there is care to be provided". The structure of the anteroom "does not encourage us to ask the patient a question, (...) a quick question becomes a mission".

3.3.2. Impact of the facilities

All HCWs reported patient monitoring difficulties: "we don't hear", "we don't see." The door between the corridor and the anteroom creates a blind spot between the room and the outside corridor. Rooms were often described as "dangerous" and the caregivers themselves said they feel insecure inside: "If something happens, you're alone, you can't get out easily, if in addition [the door] is power-operated. ..." HCWs often enter the room in pairs so as to be able to deal with the possibility of an aggressive patient.

The medical staff adapted, as far as possible, a patient's admission to an HRIR following surveillance requirements: "If I put him in the HRIR, do I put [the patient] in danger?" by reducing surveillance possibilities.

4. Discussion

This qualitative prospective survey, based on semi-structured interviews of 14 patients (8 with IP and 6 without IP) and 16 HCWs, sheds light on the experience of patients housed in HRIR and on patients' and HCWs' perceptions of their everyday isolation unit use.

4.1. Variable patient and HCW experience of isolation rooms

Two opposing isolation room impression trends were noted. Some patients valued the isolation room for its calm, space and intimacy, as well as for its protective and reassuring nature. These patients mostly were not subject to IP. Some patients, on the other hand, felt trapped and isolated in these rooms, as if quarantined. This negative experience mainly concerned IP patients with communicable diseases.

Most HCWs, in contrast, felt trapped and isolated when working in isolation rooms and tended to leave as quickly as possible. This suggests that HCWs are sensitive to the isolation facilities themselves, whereas for patients the IP had a greater impact than the isolation rooms and its constraints.

4.2. Turning in on oneself

The IP patients said they rarely left their rooms. HCWs confirmed this and mentioned the idea that patients rarely left due to the image they projected and their fear of contaminating other people. Some patients added that wearing a mask to prevent airborne infection made their contagiousness visible, which was difficult to live with. This feeling pushed them to isolate themselves, with an accompanying feeling of exclusion and loneliness. The time spent "alone between four walls" led patients to reflect upon themselves, whether they wanted to or not, and this introspection often provoked anxiety. This same sense of uncertainty and stress can be noted in patients quarantined for SARS [13,14].

4.3. Psychological suffering

The psychological disorders of patients described by HCWs were mostly stress and anxiety. Studies have shown that psychological disorders in patients subject to contact precautions were more related to their disease than to being placed in a single IP room [15]. In our study, HCWs reported that signs of depression seemed to appear after a long hospital stay [16].

4.4. Distrust

HRIR symbolized in the eyes of many patients (with or without IP) the certainty of a serious illness, over and above its contagious nature. In fact, spontaneous reactions of mistrust were common upon admission: "Why am I in this room? Do I have a serious illness? Is it contagious? What are they hiding from me?" The rooms evoked an image of quarantine for patients.

Being prepared for the future experience of isolation helps patients cope better [5], and patients' and caregivers' education may limit these psychological effects [6]. The lack of information from the medical team is a marker of asymmetry in the relationship and was mentioned several times by IP patients as a generator of mistrust [17]. Patient satisfaction with isolation for SARS was correlated with the level of information provided [7].

4.5. Recreation and room comfort

Both patients and HCWs emphasized the importance of recreational activities when hospitalized [7]. In a survey of patients in protective isolation, activities that helped patients were receiving visits, calling family members and relatives, watching television, surfing the internet, and, to a lesser extent, contact with the health-care team. In our study, contact with HCWs was correlated with anxiety, which may explain why it was the last activity cited. This fact, noted by other authors, shows that HCWs lack tools and time [5] to support patients suffering from psychological distress [5–7].

Several studies have shown that recreational activities help patients cope better with isolation, reducing stress and anxiety [5,18]. For SARS patients or patients in protective isolation, there was a feeling of fear and loneliness if they cannot receive visitors [3,13,19,20]. It is therefore essential to provide a television and a free telephone, to allow visits from relatives whenever possible and to provide an internet connection. A videoconferencing system is also essential.

4.6. The unexpected

Patients with IP did not feel stigmatized or sullied when care was provided with gloves and aprons, unlike in other studies [17,20]. Some patients reported that during the initial period of their HRIR hospital stay, these measures were difficult to endure because they made them feel contagious. Thereafter, however, they accepted that the need for personal protective equipment was justified: "to protect others and to protect myself". This observation is in line with previous work: those in isolation will gradually use strategies to regain control of their lives. Thus, patients in protective isolation "intellectualize" the need for isolation and associated measures, so as to cope with them better [21].

Our study found that HCWs sometimes experience feelings of guilt because they had difficulty caring for patients as much as they would like. This guilt arose when the tasks no longer made it possible to create satisfactory patient relationships [5], thereby causing frustration: "I feel as if I am abandoning them in these rooms."

4.7. Isolation unit architecture: a risk of adverse events

Our study highlighted a critical point regarding isolation rooms: the difficulty of monitoring patients properly because of the anteroom. The lack of direct visibility affected the organization of routine care. The camera system and the intercoms made it possible to monitor and communicate with patients remotely. HCWs do not see these as sufficient, however, and therefore adopt strategies to anticipate adverse events by placing patients whenever possible in a standard room for close monitoring.

The feeling of danger experienced by HCWs when caring for patients in isolation rooms was a constant in all interviews, especially regarding patients with tuberculosis, some of whom were aggressive. Outside the isolation room one cannot hear sounds from within, so HCWs requested installing a warning system in the event of danger. A wider glazed area between the zones, chamber, anteroom, and outer zone would improve safety if staff density allowed this surveillance, which is only possible when the sector is placed on alert of a suspected high-risk infection.

The loss of time caused by the anteroom and amplified by IP as well as the time required for donning and doffing personal protective equipment were often mentioned by HCWs as incompatible with the pace of work [22]. To minimize time lost, HCWs planned care by grouping room entries. All entries into isolation rooms were linked to care provision and never spontaneous. These short moments with the patient necessarily had an impact on the most vulnerable, especially those who suffered from technical and social isolation.

4.8. Strengths and limitations of our study

To our knowledge, ours is the first study of isolation rooms used for purposes other than proven high-risk infection situations and hematology. It allowed a cross-assessment of patients' and HCWs' perceptions.

We decided not to use scales of anxiety or depression, as they may not be sufficient to determine whether the patient is suffering

Table 3
Interview guide.

Healthcare workers
Can you describe an isolation room?
What is the procedure for the admission of a patient to an isolation room?
Do you think an isolation room is suited to all types of patients?
Are there risks associated with isolation rooms? For you? For the patient?
What effects and feelings do you experience when working in an isolation room?
Is the care the same for a patient admitted to an isolation room or a regular room?
How does the patient experience an isolation room?
Have you observed differences in patients depending on whether or not they are subject to isolation precautions?
Patients
Tell me about your healthcare experiences since your arrival
Describe your care by the nursing team, in terms of presence, support, speed of response to calls, information provided, and so on
Describe your care by the medical team, in terms of presence, support, explanations given
Tell me about your current hospitalization and how you experience it
Tell me about your mood since you were admitted to this room. Which factors affect your emotions?
Does the special clothing (mask, gloves, apron) worn by HCWs make a difference to you? How do you experience it?
Do you know why HCWs wear these additional items of clothing?
Is your room comfortable or uncomfortable? How would you describe it?
If you were to be hospitalized again, would you want to return to this type of room? Why?
Finally, are you satisfied with your stay in this room? Why?

from depression, which requires a medical diagnosis and regular evaluations.

Finally, we only collected participant statements during the interviews. We did not collect the occurrence of adverse events, if any, which have sometimes been associated with the use of IP [23] (Table 3).

5. Conclusion

Placing patients in an HRIR affects not only their emotions. It also impacts HCWs, both emotionally and organizationally. For most patients under IP, the HRIR symbolizes disease severity, contagion, and quarantine. Those who need to stay in these rooms suffer from stress and anxiety. For HCWs, the HR sector is anxiogenic because it does not allow appropriate patient monitoring due to the lack of visibility and more complex room access. This feeling of danger explains why HCWs feel dissatisfaction when working in the isolation unit.

Alerts, intercom and videoconferencing systems can improve safety and security, as well as communication with patients and their relatives. Regular evaluations of isolation unit consequences allow support personalization while anticipating harmful side effects. Patients subject to IP require psychological support.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments.

Contribution of authors

GiBe conducted the interviews. GiBe, GaBi BiBe, Babiand JCL wrote the article. All authors re-read the manuscript.

Disclosure of interest

The authors declare that they have no competing interest.

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