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Cross-sectional Study

Predictors of mental health disorders in women with breast and gynecological cancer after radical surgery: A cross-sectional study

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ABSTRACT

Introduction: In lower-middle-income countries, significant progress has been made in the therapeutic management of cancers. However, mental health disorders related to these diseases are usually underestimated by the health system. The aim of this study is to investigate the predictive factors for mental health disorders in Moroccan women with breast or gynecological cancer treated by radical surgery.

Material and methods: A cross-sectional study was carried out on Moroccan women treated by radical surgery for breast or gynecological cancer (N = 200). For each cancer type, patients were divided into two groups following age criteria. Hospital Anxiety and Depression Scale and Body image scale were used.

Results: Age had a significant effect on mental health disorders but not the type of cancer. Younger women showed significantly greater mental health disorders than older women ($p \leq 0.001$). The predictive model for high anxiety and depression included the effect of the following variables: Being younger, having lower income, and advanced tumor stage. For higher body image dissatisfaction, the variables are as follows: being younger, having fewer children, lower-income, and advanced tumor stage.

Conclusion: The association of mental health disorders in patients with breast or gynecological cancer increases their distress. The establishment of management protocols for these disorders is strongly recommended in oncology departments.

1. Introduction

Cancer incidence and mortality are rapidly increasing worldwide and the most common types in women are breast cancer and gynecological cancer [1]. According to the literature, mental disorders are common in cancer patients and psychological well-being is increasingly considered an important part of cancer care [2]. According to a recent study, cancer patients with diagnosed cancer-related psychiatric disorders were at higher risk of death. Indeed, among the studied patients, those who received psychiatric treatment had lower mortality rates [3]. Moreover, several researchers have shown higher rates of anxiety and depression in women with breast and gynecological cancer [4–9]. Mostly, epidemiological data found that depression increases non-adherence to treatment in women with breast cancer [10], whereas, specific depression treatment has been associated with longer subsequent survival for women with metastatic breast cancer [11].

For women, the breast is not seen as a simple organ but a symbol of beauty, seduction, and motherhood. Hence, mastectomy is considered an extreme source of mental health diseases, especially depression and anxiety disorders [12,13]. This was mostly linked to body image dissatisfaction [14,15].

The uterus and ovary are reproductive organs associated with fertility and even femininity. Indeed, a woman suffering from cancer and undergoing hysterectomy and or oophorectomy can also exhibit major psychological repercussions [12]. These mental disorders could be worsened by many risk factors with age as an overwhelmingly one [16]. Studies have shown the relevance of age as an important factor in the comparison of mental health distress between types of cancer [17].

In Morocco, the very few studies that have been interested in the evaluation of mental disorders in women with cancer have focused on breast cancer [18,19]. However, to the best of our knowledge, there are no studies dealing with mental health disorders on patients suffering from gynecological cancer in Morocco. Moreover, our study seeks, on the one hand, to compare mental disorders in two patient groups living

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with cancer; 'Breast cancer group' and the 'Gynecological cancer group'. On the other hand, to explore the predictive factors of mental disorders in women with breast and gynecological cancer treated by radical surgery.

2. Material and Methods

2.1. Participants

A 10-month cross-sectional study was carried out in the Mohammed VI Center for the Treatment of Cancers, Ibn Rochd University Hospital of Casablanca, Morocco. During this work, 210 women, who had undergone radical surgery for breast or gynecological cancer, were invited to take part in the study among patients coming for the follow-up at the oncology department. Ten of them were excluded because they wished to not participate to the study. The inclusion criteria were as follows: women over 18 years old with a confirmed diagnosis of primary breast cancer or gynecological cancer, those accepting the participation to this study, and who provided written consent (for unschooled patients a verbal consent followed by a fingerprint were used as a consent proof), those with T1–T3 tumor stages; had undergone a mastectomy or hysterectomy/oophorectomy for more than three weeks and not more than six months. Exclusion criteria included not being born in Morocco, having T4 tumor stage, being unable to understand and speak Moroccan dialect language, having any cognitive and/or hearing loss, having a history of psychiatric disorders, and having a previous diagnosis of primary cancer in other locations. The patients were consecutively selected and distributed as follows: 'Breast cancer group' containing 100 patients treated by mastectomy, divided into 'younger' (younger than 50 years old; n = 56) and 'older' (50 years old or older; n = 44). The 'Gynecological cancer group' contains 100 patients treated by hysterectomy and or oophorectomy, also divided into 'younger' (younger than 50 years old; n = 44) and 'older' (younger than 50 years old; n = 56). This age threshold was used by previous studies to perform the comparison between young and older women [17,20].

2.2. Measures

2.2.1. Socio-demographic and clinical characteristics

Sociodemographic characteristics contain the following criteria: age, marital status, number of children, medical coverage system, living area, educational level, occupation, occupational status, and monthly income in Morrocan Dirham (MDh) (The 2698 MDh constitutes the Interprofessional Guaranteed Minimum Wage in Morocco).

Clinical characteristics were obtained from participants themselves and were completed with medical records. These included: Type of cancer, surgery undergone, tumor stage, time since diagnosis, number of antineoplastic treatments, and disease recurrence.

2.2.2. Assessment of anxiety and depression disorders

The Hospital Anxiety and Depression Scale (HADS) [21], translated and validated in Arabic [22], assesses the dimensions of anxiety and depression in non-psychiatric populations and largely used in psycho-oncology research. In addition, it offers the advantage of eliminating, at the same time, the physical symptoms that can be bias factors. The HADS consists of two subscales of 7 items each, which give two scores measuring, the first one for anxiety HAD-A and the second one for depression HAD-D. The anxiety and depression subscales have three levels: 0 to 7 -absence of anxiety or depressive disorders; from 8 to 10 – suspected anxiety or depressive disorders; and from 11 to 21-proven anxiety or depressive disorders. The total HADS-T scale is ranging from 0 to 14 (absence of anxio-depressive disorders) and ranging from 15 to 42 (existence of anxio-depressive disorders). The Cronbach's α for the HADS scale used in this study is 0.98 exhibiting a very good validity.

2.2.3. Assessment of body image dissatisfaction

In the current study, the body image dissatisfaction regarding breast cancer and gynecological cancer patients was assisted using the Body Image Scale (BIS) [23]. This scale includes 10 items developed to evaluate briefly and consistently the affective, behavioral, and cognitive aspects of body image in cancer patients who are undergoing appearance changes. It reflects also the impact of cancer treatment, including surgery, on the body image of the breast and gynecological cancer patients. The BIS components score ranges from 0 (not at all) to 3 (very much) and the BIS final score is ranging from 0 (body image satisfaction) to 30 (strong body image dissatisfaction). The Cronbach's α for this study is 0.98 which demonstrated very good reliability of the used questionnaire.

BIS was the subject of a translation from English to Arabic and back-translation by translators/linguists. Then, the translation was examined and merged in a single version validated by a committee in Moroccan universities experts in this field to ensure the accuracy of the translation and the validity of the content. Subsequently, a pilot study was conducted on a group of 30 gynecological cancer/breast cancer patients excluded from the study.

2.3. Procedure

Oncologists invited women who consulted for a check-up to take part in the study. The researcher verbally presented the study to the women and then presented a letter of consent to sign. Participants who were not willing to participate were excluded. The researcher read each question and its answers, then ticked the selected answer. The average time dedicated to fulfilling the questionnaire was between 20 and 30 min. Patients were recruited consecutively until the sample size was sufficient.

2.4. Data analysis

Patients' socio-demographic and medical characteristics were statistically analyzed and displayed as numbers/percentage distribution, mean and standard deviation. Qualitative variables were analyzed using Pearson's Chi-square test and Cramer's. Quantitative variables were analyzed using two-way analysis of variance with 'cancer type' and 'age groups' as factors, and mental disorders as dependent variables. We tested for assumptions of normality and homogeneity of variances; if they were not satisfied, we performed the Kruskal–Wallis test with Post-hoc calculations. Correlation analyses were conducted among socio-demographic, clinical characteristics, and mental disorders, and also between the mental disorders. Variables significantly associated with mental disorders in the correlation analysis were entered in the multiple regression analysis to assess the impact of socio-demographic and clinical characteristics on each mental disorder variable.

Statistical significance was set at p-value <0.05. The statistical analysis was carried out using the SPSS version 20.0 software.

3. Results

3.1. Socio-demographic and clinical characteristics of the participants

The socio-demographic and medical characteristics of the patients are shown in Table 1. The mean age of participants was 49.60 ± 1.59 years.

In the breast cancer group, 39% of patients are married and most of them have children (66%). The majority (95%) are benefiting from RAMed (a Moroccan health insurance program intended for the poor population), referred to as RAMedist in the subsequent text, 56% live in urban areas and more than half (55%) are unschooled. Only 6% are professionally active, of which 4% are housemaids and 2% with an intermediate profession. The vast majority (77%) have a family monthly income not exceeding 2698 MDh (280 US Dollar). Most of the

Table 1
Sociodemographic and clinical characteristics of the participants.

	Breast cancer (n = 100)			Gynecological cancers (n = 100)		
Age						
Global sample	48.26	(11.40)	28–80	50.94	(11.33)	30–76
Younger (<50 years)	40.04	(5.881)	28–49	40.18	(5.654)	30–49
Older (≥50 years)	58.73	(7.428)	50–80	59.75	(5.816)	50–76
Marital status (%)						
Married	39			39		
Widowed	26			27		
Divorced	21			17		
Single	14			17		
Number of children (%)						
No child	34			37		
Only one child	14			13		
Two children	15			11		
Three children	11			10		
More than three children	26			29		
Medical coverage system (%)						
RAmed	95			88		
CNOPS/CNSS	5			12		
Living area (%)						
Rural	44			42		
Urban	56			58		
School level (%)						
Unschooled	55			65		
Primary	25			22		
Secondary	16			10		
High	4			3		
Occupation (%)						
Housemakers	94			84		
Housemaids	4			15		
Intermediate professions	2			1		
Occupational status (%)						
Inactive	93			81		
Active	6			16		
Retired	1			3		
Monthly income (%)						
⩽2698DH	77			84		
2699-5396DH	19			14		
5397-8094DH	4			2		
Surgery (%)						
Mastectomy	100					
Hysterectomy				75		
Oophorectomy				25		
Tumor stage (%)						
T1	34			23		
T2	25			8		
T3	41			69		
Time since diagnosis (%)						
<1 an	84			69		
≥1 an	16			31		
Antineoplastic treatment (%)						
One treatment	86			66		
Two treatments	13			33		
Three treatments	1			1		
Disease recurrence (yes) (%)	4			15		

Mean (Standard deviation), range, and percentages (%).

participants (41%) are T3 tumor stage, the vast majority (84%) have diagnosed their disease for more than a year and 86% have had only one antineoplastic treatment. Only 4% of the participants have had a recurrence of their illness.

In the gynecological cancer group, 39% of the patients also married and 63% have children. The majority (88%) are RAMedists, 42% live in rural areas and more than half (65%) are unschooled. Only 16% are professionally active and 84% have a family income not exceeding 2 698DH. In this group, 75% of patients had uterine and/or cervix cancer while 25% presented ovarian cancer. The T3 tumor stage was found in most patients (69%) and the time since diagnosis exceeds 1 year for 69% of patients. Two-third of patients (66%) have had only one antineoplastic treatment and a minority (15%) of patients have a recurrence of their illness (Table 1).

3.2. The relationship between socio-demographic/clinical characteristics and age groups

Data analyses revealed significant relationships between some socio-demographic characteristics and age groups. Compared to older women, we found that younger tend to be single or divorced ($p < 0.001$), with fewer children ($p < 0.001$), and with a relatively higher level of

Table 2
Relationship between socio-demographic, clinical characteristics and age groups.

	Younger (<50 ans)	Older (≥50 ans)	*p* value	Cramer's V
Marital status (%)				
Married	44	34		
Widow	5	48	.000	.51
Divorced	26	12		
Single	25	6		
Number of children (%)				
No child	51	20		
Only one child	11	16	.000	.48
Two children	18	8		
Three children	12	9		
More than three children	8	47		
Medical coverage system (%)				
RAmed	93	90	.447	.054
CNOPS	7	10		
Living area (%)				
Rural	44	42	.775	.020
Urban	56	58		
School level (%)				
unschooled	46	74		
Primary	27	20		
Secondary	21	5	.000	.320
High	6	1		
Occupation (%)				
Housemakers	84	94	.076	.161
Housemaids	14	5		
Intermediate professions	2	1		
Occupational status (%)				
Inactive	82	92	.077	.16
Active	16	6		
Retired	2	2		
Monthly income (%)				
⩽2698DH	76	85	.14	.14
2699-5396DH	19	14		
5397-8094DH	5	1		
Type of cancer (%)				
Breast cancer	56	44	.103	.176
Gynecological cancer	44	56		
Surgery (%)				
Mastectomy	56	44	.043	.177
Hysterectomy	29	46		
Oophorectomy	15	10		
Tumor stage (%)				
T1	31	26	.349	.103
T2	19	14		
T3	50	60		
Time since diagnosis (%)				
<1 an	75	78	.617	.035
≥1 an	25	22		
Antineoplastic treatment (%)				
One treatment	78	74	.334	.105
Two treatments	22	24		
Three treatments	0	2		
Disease recurrence (yes) (%)	11	8	.469	.051

Pearson's Chi-square, $p < 0.05$.

education ($p < 0.001$). There were no significant differences for clinical variables between groups (Table 2).

3.3. Mental health disorders

Results regarding mental disorders, reveal age as the only associated factor, while no association was found with cancer type. In the gynecological cancer group, mental disorders were significantly higher among young women ($p \leq 0.001$). For the breast cancer group, only body image dissatisfaction was significantly higher in young women ($p \leq 0.001$). Admittedly, there were no significant differences between the young or the older groups, nor a significant interaction effect between age and type of cancer (Table 3).

3.4. Associations between mental health disorders, socio-demographic and clinical characteristics

The associations displayed in Table 4 reveal that all mental distress variables were strongly associated ($p < 0.001$), showing marked co-morbidity between high anxiety, high depression, and high body image dissatisfaction. These data also show a strong association between marital status, occupation, occupational status, and all mental disorders ($p < 0.05$) and also an association between the type of surgery and depression ($p < 0.05$). Being younger, having fewer children, having an advanced tumor stage were associated with higher mental disorders (Table 4).

The Mann-Whitney test was used to study the association between recurrence of illness, medical coverage system, and mental health disorders Thus, women who had the recurrence were the most depressed ($p < 0.05$; mean rank of "yes" equal to 125.84 and mean rank of "no" equal to 97.84) and RAMedists have higher anxiety ($p < 0.01$; mean rank of RAMed equal to 104.16 and mean rank of CNOPS/CNSS equal to 61.06), higher depression ($p < 0.01$; mean rank of RAMed equal to 103.87 and mean rank of CNOPS/CNSS equal to 64.24), and higher body image dissatisfaction ($p < 0.01$; mean rank of RAMed equal to 103.53 and mean rank of CNOPS/CNSS equal to 67.85).

3.5. Predictive factors of mental health disorders

Table 5 displays multiple regression analysis, with three prediction models. The percentage of variance varied between 11.89% and 25.84%. The variables that predict higher anxiety and depression are: being younger, having low income, and advanced tumor stage. For the dissatisfaction of body image, as well as the previous variables, having fewer children contributes to the increase of this disorder.

Table 4
Associations between mental health disorders and socio-demographic and clinical characteristics.

	Anxiety	Depression	Body image dissatisfaction	
Age	-.303**	-.302**	-.369**	Spearman's Rho
number of children	-.257**	-.239**	-.373**	
School level	-.067	-.066	.015	
Monthly income	-.157*	-.148*	-.253**	
Tumor stage	.178*	.188**	.205**	
Treatment	.044	.060	.104	
Anxiety		.957**	.642**	
Depression			.645**	
Marital status	20.58(3)**	17.39(3)**	27.09(3)**	Kruscal-Wallis Chi − square(df)
Occupation	13.34(2)**	11.17(2)*	9.05(2)**	
Occupational status	13.29(2)**	9.33(2)**	7.03(2)*	
Surgery	3.35(2)	4.26(2)	6.15(2)*	

*p < 0.05, **p < 0.01.

4. Discussion

In Morocco as well as other developing countries, very few studies focusing on the evaluation and the psychological care of patients suffering from breast and gynecological cancer were made. Starting from this, efforts should be deployed to improve appropriate health care regarding anxiety, depression, and impaired body image for these types of cancer.

Our results revealed that the majority of our participants are RAMedists, unschooled, professionally inactive, and with a monthly family income equal to or less than Interprofessional Guaranteed Minimum Wage (2698 MDh). These results describe the socio-economic vulnerability of the population treated in the public healthcare structures. Thus, women who have RAMed tend to be more anxious and depressed and with more body image dissatisfaction. These results are in line with a previous study reporting low socioeconomic level as a predictor of mental distress in women with breast cancer [24]. Our data also showed that the advanced tumor stage is associated with higher mental distress, which is in agreement with another study along the same lines [25]. Moreover, the medical factor that has been associated with high depression in our study population is the recurrence of the disease, which supports the previous study in women with ovarian cancer [25].

In our study, it turned out that age is the factor that has a significant effect on mental variables unlike the type of cancer. In the gynecological cancer group, young women had significantly higher anxiety,

Table 3
Mental health disorders.

	Breast cancer			Gynecological cancer			Statistics
	Total (n = 100)	Younger (n = 56)	Older (n = 44)	Total (n = 100)	Younger (n = 44)	Older (n = 56)	
Anxiety	12.95 (5.92)	13.61 (5.83)	12.11 (6)	13.04 (5.72)	15.25(5.45)[b]	11.3(5.36)[b]	$F^1(1,196) = 0.267; p = 0.6$ $F^2(1,196) = 11.37; p = 0.001$ $F^3(1.196) = 2.31; p = 0.13$
Depression	12.71 (6.22)	13.48 (6.24)	11.73 (6.12)	12.77 (5.91)	15(5.83)[b]	11.02(5.40)[b]	$F^1(1,196) = 0.231; p = 0.63$ $F^2(1,196) = 11.637; p = .001$ $F^3(1,196) = 1.754; p = .187$
Body image dissatisfaction	14.40(10.77)	17.27(11.09)[a]	10.75(9.24)[a]	13.17(10.43)	18.2(10.69)[b]	9.21(8.38)[b]	Kruskal-Wallis (3) = 24.32, p = 0.000

Mean (standard deviation).
F^1, type of cancer; F^2, age; F^3, interaction
a Significant differences between younger and older BC groups
b Significant differences between younger and older GC groups

Table 5
Multiple regression for mental distress variables.

	Adjust R2	F	B (95%CI)	SE	Beta	Sr2
Anxiety	0.145	12.26				
Constant			21.29 (16.59; 25.99)	2.38		
Age			−0.17 (-0.23; −0.09)	0.03	− 0.32***	−0.33
Monthly income			−2.50 (-4.26; −0.77)	0.87	− 0.19**	−0.20
Tumor stage			1.25 (0.39; 2.12)	0.44	0.189**	0.20
Depression	0.14	11.89				
Constant			20.77 (15.87; 25.67)	2.49		
Age			−1.17 (-0.24;-0.09)	0.035	− 0.32***	−0.32
Monthly income			−2.46 (-4.26;-0.66)	0.91	− 0.18**	−0.19
Tumor stage			1.39 (0.48; 2.29)	0.46	0.18**	0.176
Body image dissatisfaction	0.33	25.84				
Constant			37.10 (30.94; 46.51)	3.86		
Age			−0.34 (-0.46;-0.22)	0.06	− 0.36***	−0.369
Number of children			−1.46 (-2.27;-0.64)	0.41	− 0.228**	−0.204
Monthly income			−6.98 (-9.77;-4.18)	1.42	− 0.294**	−0.332
Tumor stage			2.47 (1.07; 3.87)	0.70	0.204**	0.216

Model adjusted for age, monthly income, tumor stage and number of children.
SE, standard error; sr2, squared semi-partial correlation. *p < 0.05, **p < 0.01, ***p < 0.001.

depression, and body image dissatisfaction than older ones. These results are consistent with those in studies showing higher mental health impairment in young women with breast or gynecological cancer compared to older women [16,17,24,26]. However, a recent study regarding biopsychosocial problem-related distress between women diagnosed with breast cancer or gynecological cancer has shown that gynecological cancer patients represent a high-risk group, reporting greater problem-related distress and higher levels of requested assistance than breast cancer patients [27]. Our data revealed also that being young is negatively impacting the perception of body image in patients with breast cancer. These results are not surprising, as long as the female reproductive organs (uterus, ovary) and breasts represent sexuality, fertility, and motherhood [28–30].

In parallel, it seems that anxiety and depression morbidities are strongly associated with dissatisfaction with the patient's body image. Our findings are in agreement with others showing that persistent distress related to body image is closely linked to mental disorders, mainly anxio-depressive syndrome [17,31–33]. In addition to that, new data revealed that 33% of breast cancer survivors with dissatisfied body image retain this feeling for nine years after surgery [34,35].

To deal with this, clinical research on arts-based approaches for women, with breast cancer and gynecological cancer, has gained a growing interest in the last decade with promising results. Hence, arts-based approaches involving creative arts therapy and arts medicine showed strong effects on the mental health of women living with breast cancer or gynecological cancer [36]. According to another study, self-compassion and hope-focused therapy may be useful to relieve body image dissatisfaction in patients with breast cancer [37]. In the same vein, psychologists at Macquarie University in Sydney have developed a program called "My Changed Body", which is a web platform containing writing exercises to encourage compassion and minimize mental distress related to body image dissatisfaction in women with breast cancer [38].

The multiple regression analysis conducted in the two populations of the present investigation showed that only a few sociodemographic and clinical characteristics were related to mental disorders. Thus, having few children is a predictor of body image dissatisfaction. Being younger, having low income, and advanced tumor stage predicted more anxiety, depression, and body image dissatisfaction. In this optic, our results are in perfect agreement with other studies reporting that younger age, lower household income, and financial difficulties are the main factors associated with greater distress in women with breast and gynecological cancer [18,27]. Furthermore, the patient's age is found to be a principal factor associated with body image in post-operative breast cancer patients [39]. Among others, the advanced stage of cancer is in its turn confirmed to be a predictor of mental distress in women with breast and ovarian cancer [40,41]. Overall, our findings point to the importance of the establishment of a program taking into account and responding to specific psychological needs of patients with breast and gynecological cancer [42,43].

5. Conclusion

In our study, young women showed higher anxiety and depression and greater body image dissatisfaction. Mental disorders were strongly associated with the outcome of breast and gynecological cancers in our participants. Indeed, we recommend that decision-makers in the Moroccan health sector reflect on the development of specific protocols to manage the psychological distress of patients with breast and gynecological cancer considering their socio-demographic and economic characteristics.

6. Limitations

Our study has several limitations. First of all, it is considered as a preliminary study, our results must be confirmed in a longitudinal design. Second, our sample was taken in a single hospital center that may not be representative of the general population of Moroccan women with gynecological cancer. Finally, the BIS has been adapted in Arabic but has not been subject to psychometric validation.

Ethical approval

This study was conducted in a framework that respects the ethics and dignity of patients. Ethical approval was obtained from the Moroccan Association for research and ethics, Research Ethics Committee, (N° 02/REC/20). All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee. Confidentiality and anonymity criteria were met as charted by the declaration of Helsinki and its later amendments. Informed consent was obtained from all individual participants included in this study.

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Author contribution

AA: conception and design of the study. AA, OE, NA, MG: data collection. AA, OE, MM: acquisition and data analysis. AB, AA: Patients recruitment. AE, MM, ARJ, AB: interpretation of data. AA, AE: drafting of the work. MM, AB, ARJ, AE: revising the manuscript critically and final approval of the manuscript. All authors approved the final version of the manuscript to be submitted.

Trial registry number

1. Name of the registry: research registry
2. Unique Identifying number or registration ID: researchregistry6567
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): https://www.researchregistry.com/browse-the-registry#home/

Guarantor

ELGOT Abdeljalil.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Declaration of competing interest

Authors have no conflicts of interest to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2021.102278.

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