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RESEARCH ARTICLE

Evaluation of rational drug use in primary healthcare centres of Probolinggo District, Indonesia

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Abstract

Background: The Indonesian government has been working on optimising drug use in primary healthcare centres (puskesmas) of the Probolinggo District Health Office (dinkes). Objective: This study aimed to evaluate the rationality of drug use (RDU) using indicators set by the Indonesian Ministry of Health. **Method:** A retrospective descriptive study was conducted using data from 33 Puskesmas in Probolinggo Dinkes in 2022. Data on patients diagnosed with Acute Respiratory Infection (ARI) non-pneumonia (n = 36,378), non-specific diarrhoea (n = 4,291), and myalgia injection cases (n = 9,641) were collected. **Result:** The study's findings showed that the percentage of antibiotics for ARI was 17.11%, meeting the standard. Of the 33 Puskesmas, 67% met the standard, while 33% did not. Meanwhile, the antibiotic used for non-specific diarrhoea was 9.58%, exceeding the tolerance limit, with 55% of Puskesmas meeting the standard and 45% not. The percentage for injectable drugs in myalgia cases was 0.43%, in line with the standard, with 82% Puskesmas met standard and 18% not. **Conclusion:** The study found that antibiotic usage for ARI and injections for myalgia met the standards, but antibiotic usage for non-specific diarrhoea cases did not.

Introduction

Improper use of drugs can lead to unwanted results, such as a decrease in the quality of treatment. This, in turn, can result in increased mortality and morbidity rates, reduced drug availability due to mismanagement of pharmaceutical resources, as well as increased medical costs (Ofori-Asenso & Agyeman 2016; Qibtiyah, Wahyuhadi, & Khotib 2023).

Rational Drug Use (RDU) has been implemented in primary healthcare centres in increasing numbers. In 2017, 30.3% of districts/cities had implemented POR at primary health centres; in 2019, this number increased to 47.08%. Despite this, many primary healthcare centres still have not implemented RDU, partly because not all primary healthcare centres have pharmacy staff. The improper use of antibiotics causes the emergence of Antimicrobial Resistance (AMR) and the suboptimal achievement of RDU in primary healthcare centres (Bakhit *et al.,* 2018). It is reported that three-quarters of all antibiotic use occurs in the community, where primary care practitioners are responsible for prescribing these antibiotics (Bruzzese, 2018).

The most frequently prescribed outpatient antibiotics are for respiratory infections (ARI), non-specific pneumonia, and diarrhoea (Jeffs *et al.,* 2020). Antibiotic prescriptions in such cases have little to no benefit (McKay *et al.,* 2016). In myalgia cases, it was found that injection use exceeded the tolerance limit (≤ 1%) in studies in various regions of Indonesia (Indonesian Ministry of Health, 2021). Injections are not the proper course of treatment for myalgia cases because they do not fulfil one of the pharmacological rules. Symptomatic therapy for myalgia should be given orally, which is relatively safer.

Research on rational drug use was conducted in a primary health care facility to evaluate the rationality

of drug use in Pamekasan using the World Health Organisation's (WHO) prescribed indicators. The results showed that the percentage of antibiotic prescribing for non-pneumonia ARI was 47.27%, exceeding the 20% tolerance limit set by the Indonesian Ministry of Health. The percentage of antibiotics prescribed for non-specific diarrhoea was 59.85%, exceeding the 8% tolerance limit. The percentage of injections prescribed was 36.15%, exceeding the 1% tolerance limit. These findings indicate that the use of antibiotics and injections in Puskesmas Pamekasan was not rational, which could lead to antibiotic resistance and other health risks. Therefore, finding rational drug use in the Probolinggo District is important. (Prasetio *et al.,* 2020; Kusumawardani & Andrajati 2024).

The Pharmaceutical Devices Programme targeted the enhancement of pharmaceutical services from 2017 to 2019; this initiative aimed to enhance pharmacy services and RDU within healthcare institutions. One benchmark for reaching these objectives is the percentage of puskesmas adhering to pharmaceutical service standards (Indonesian Ministry of Health, 2014). Based on this background, a study evaluating the use of RDU by the pharmaceutical services at the puskesmas in Probolinggo, East Java, Indonesia, is necessary.

The purpose of this study was to evaluate the rationality of using ARI drugs in non-pneumonia and non-specific diarrhoea cases and the use of injections in myalgia cases at primary healthcare centres using indicators set by the Indonesian Ministry of Health.

Methods

This was an observational study with retrospective data using a descriptive analysis design. The research involved reviewing official documents, including reports on rational drug use in primary healthcare centres (puskesmas) of the Probolinggo District Health Office. This included information from all patients with non-pneumonic ARI and non-specific diarrhoea and injection use for myalgia cases in all Probolinggo District primary healthcare centres in 2022, totalling 33. The rational drug use calculations were done by comparing the suitability of the drug prescribed with the Clinical Practice Guidelines for doctors at first-level healthcare facilities issued by the Indonesian Ministry of Health, and calculations were carried out by pharmacists. The data taken were the number of all patients diagnosed with non-pneumonic ARI, patients with non-specific diarrhoea, and injection use for myalgia cases. The drug use evaluation included the number of target patients and the number of patient outcomes for each primary healthcare centre, which were then compared with the standard or tolerance limit for each case. The percentage of antibiotic prescriptions for non-pneumonic ARI patients has a tolerance limit of 20%, the percentage of antibiotic prescriptions for non-specific diarrhoea patients has a tolerance limit of 8%, and injection prescriptions for myalgia (metamizole injection) patients have a tolerance limit of 1%. The data that had been collected were then analysed descriptively in the form of percentages and presented in tabular form (Directorate of Pharmaceutical Services Development, 2017).

Results

This study's findings revealed that there were still many cases of irrational drug use in each parameter indicator for non-pneumonic ARI patients, non-specific diarrhoea patients, and myalgia patients. Table I shows the results of RDU based on indicators provided by WHO in Probolinggo Puskesmas during 2022. The percentage of antibiotics prescribed for ARI and myalgia cases where injections were used met the Ministry of Health standards. In contrast, the antibiotic prescriptions for non-specific diarrhoea patients did not meet the Ministry of Health standards. The average percentage of antibiotic use for non-specific diarrhoea patients in Probolinggo puskesmas is ≤ 8%. The results of examining all puskesmas in the Probolinggo District exceeded this by 9.58%.

Discussion

Non–pneumonic ARI cases

In 2022, the percentage of antibiotic prescriptions for non-pneumonic ARI patients at the Probolinggo District Health Centre reached 17.11%. In this case, the tolerance limit target of ≤ 20% has been met. Out of the 33 primary health centres, 22 met the standards (67%), while 11 did not meet the standards (33%). In non-pneumonic ARI, the use of antibiotics is not recommended. Emphasis should be placed on therapy that treats symptoms of non-pneumonia. (Ministry of Health, 2022). In the case of non-pneumonic, supporting data are needed, such as a fever that reaches more than 38°C and the number of leukocytes exceeding the normal limit (5,000-10,000/µL, (Indonesian Ministry of Health, 2021).

Table I: Percentage of antibiotic use in patients with non-pneumonia ARI and non-specific diarrhoea and injection in myalgia cases at Probolinggo District primary healthcare centres in 2022

Primary healthcare centres	Use of antibiotics for non-pneumonia (standard ≤ 20%) (Indonesian Ministry of Health, 2015)			Use of antibiotics for non-specific diarrhoea (standard ≤ 8%) %) (Indonesian Ministry of Health, 2015)			Use of injection in myalgia (standard ≤ 1%) (Indonesian Ministry of Health, 2015)		
	Number of patients	Target	Number of patients using antibiotics and the percentage N (%)	Number of patients	Target	Number of patients using antibiotics and the percentage N (%)	Number of patients	Target	Number of patients using antibiotics and the percentage N (%)
Sukapura	441	88	88 (19.95%)*	75	6	11 (14.67%)	157	2	3(1.91%)
Sumber	657	277	155 (23.59%)	73	13	0 (0%)†	237	24	0(0%)†
Kuripan	798	160	329 (41.23%)	90	10	13 (14.44%)	166	2	3(1.80%)
Bantaran	1588	318	108 (6.80%)*	85	7	5 (5.897%)†	0	0	0(0%)†
Leces	1139	227	178 (15.63%)*	126	10	0 (0%)†	144	0	0(0%)†
Jorongan	885	177	168 (18.98%)*	68	5	11 (16.18%)	119	1	3(2.52%)
Tegalsiwalan	865	173	341.0 (39.42%)	140	11	10 (7.14%)	1	0	0.0(0%)†
Banyuanyar	472	94	49 (10.38%)*	79	6	9 (11.39%)	133	1	0(0%)†
Klenang kidul	927	185	75 (8.09%)*	86	7	6 (6.98%)†	825	8	1(0.12%)†
Tiris	751	150	143 (19.04%)*	103	8	4 (3.88%)†	313	3	0(0%)†
Ranugedang	552	110	111 (20.11%)	88	7	35 (39.77%)	20	0	9(45%)
Krucil	2000	400	380 (19%)*	215	17	15 (6.98%)†	455	5	0(0%)†
Wangkal	1435	287	298 (20.77%)	114	9	8 (7.01%)†	1	0	0(0%)†
Condong	265	53	132 (49.81%)	36	3	9 (25%)	12	0	0(0%)†
Pakuniran	881	176	154 (17.48%)*	127	10	5 (3.93%)†	582	6	0(0%)†
Glagah	828	166	59 (7.12%)*	131	10	35 (26.71%)	23	0	7(30.43%)
Kotaanyar	1425	285	704 (49.40%)	272	22	108 (39.70%)	121	1	0(0%)†
Paiton	3088	618	511 (16.54%)*	380	30	71 (18.69%)	6.00	0	0.00(0%)†
Jabungsisir	360	72	108 (30%)	60	5	12 (20%)	0	0	0(0%)†
Besuk	1244	249	201 (16.16%)*	162	13	12 (7.40%)†	443	4	0(0%)†
Bago	518	104	89 (17.18%)*	60	5	6 (10%)	416	4	0(0%)†
Kraksaan	1635	327	0 (0%)†	222	44	0 (0%)†	512	102	0(0%)†
Krejengan	1078	216	183 (16.97%)†	125	10	6 (4.8%)†	353	4	0(0%)†
Pajarakan	476	95	90 (18.90%)†	87	7	7 (8.04%)	409	4	1(0.24%)†
Maron	648	130	14 (2.16%)†	124	10	3 (2.41%)†	498	5	0(0%)†
Suko	376	75.2	31 (8.24%)†	84	10	7 (8.33%)	208	2	10(4.80%)
Gending	1420	284	369 (25.99%)	239	19	49 (20.50%)	153	2	4(2.61%)
Dringu	630	126	241 (38.25%)	70	6	8 (11.42%)	536	5	0(0%)†
Wonomerto	570	114	82 (14.39%)†	123	10	2 (1.62%)†	389	4	0(0%)†
Lumbang	504	101	116 (23.01%)	73	6	3 (4.10%)†	20	0	0(0%)†
Tongas	501	100	1 (0.19%)†	112	9	0 (0%)†	116	1	0(0%)†
Curahtulis	1058	211	30 (2.83%)†	135	11	6 (4.44%)†	414	4	0(0%)†
Sumberasih	6363	1273	388 (6.09%)†	707	7	6 (0.84%)†	1859	149	0(0%)†
Total	**36,378**	**7,276**	**6,226 (17.11%)**	**4,291**	**374**	**411 (9.58%)**	**9,641**	**337**	**41(0.43%)**

†Primary healthcare that meets prescription standards

Non-specific diarrhoea cases

Meanwhile, the percentage of antibiotics prescribed to patients with non-specific diarrhoea at the Probolinggo District Health Centre reached 9.58%. This exceeds the tolerance limit set at ≤8%, with 18 community health centres meeting the standards (55%) and 15 not meeting the standard (45%). Antibiotics should be avoided in cases of diarrhoea with unknown causes (Bruzzese, 2018). Mild diarrhoea only requires anti-diarrheal therapy (Nemeth & Pflehaar, 2023). In this case, giving antibiotics should only be considered when a fever reaches more than 38°C (Indonesian Ministry of Health, 2021).

Cases of injection in myalgia patients

Furthermore, 0.43% of drugs were prescribed in the form of injections for myalgia patients at the Probolinggo District Health Centre in 2022. This meets the established tolerance limit of ≤ 1%, with 27 primary health centres meeting the standard (82%) and six not meeting the standard (18%). Providing therapy via injection can lead to increased *c*osts in drug procurement (Gotham *et al*., 2019). Public belief that drugs in injection form are more effective than drugs in oral form influences doctors' decisions in prescribing drugs by injection (Ofori-Asenso & Agyeman, 2016). To relieve symptoms, Myalgia patients should be given oral drugs such as diclofenac sodium cream and neurotropic vitamins (Indonesian Ministry of Health, 2015*).*

Conclusion

The research findings indicated that the administration of antibiotics for acute respiratory infections (ARI) and injections for myalgia adhered to the established standards. However, using antibiotics for non-specific diarrhoea cases did not meet the recommended criteria.

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