

Lampiran

INFORMED CONSENT (SURAT PERSETUJUAN)

Yang bertanda tangan di bawah ini:

Nama : Nuriya Ayu Islami
Tempat/ Tanggal Lahir : Sukoharjo, 2 Juni 1994
Alamat : Sukareja Girikerto, Turi, Sleman

bersama ini menyatakan kesediaan sebagai subjek dalam praktik Continuity of Care (COC) pada mahasiswa Prodi Pendidikan Profesi Bidan T.A. 2022/2023. Saya telah menerima penjelasan sebagai berikut:

1. Setiap tindakan yang dipilih bertujuan untuk memberikan asuhan kebidanan dalam rangka meningkatkan dan mempertahankan Kesehatan fisik, mental ibu dan bayi. Namun demikian, setiap tindakan mempunyai risiko, baik yang telah diduga maupun yang tidak diduga sebelumnya.
2. Pemberi asuhan telah menjelaskan bahwa ia akan berusaha sebaik mungkin untuk melakukan asuhan kebidanan dan menghindari kemungkinan terjadinya risiko agar diperoleh hasil yang optimal.
3. Semua penjelasan tersebut di atas sudah saya pahami dan dijelaskan dengan kalimat yang jelas, sehingga saya mengerti arti asuhan dan tindakan yang diberikan kepada saya.

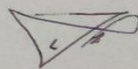
Dengan demikian terdapat kesepakatan antara pasien dan pemberi asuhan untuk mencegah timbulnya masalah hukum di kemudian hari.

Demikian surat persetujuan ini saya buat tanpa paksaan dari pihak manapun dan agar dipergunakan sebagaimana mestinya.

Yogyakarta, 12 Desember 2023

Mahasiswa

Klien



Suprihatin

Nuriya Ayu Islami

Lampiran

SURAT KETERANGAN

Yang bertanda tangan di bawah ini:

Nama Pembimbing Klinik : Sri Suryanti, S.Tr.Keb.,Bdn

Instansi : Puskesmas Turi

Dengan ini menerangkan bahwa:

Nama Mahasiswa : Suprihatin

NIM : P07124522090

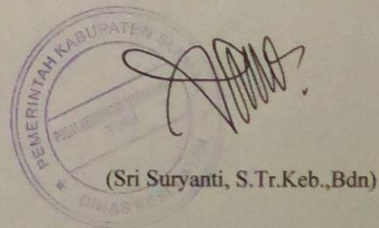
Prodi : Pendidikan Profesi Bidan

Jurusan : Kebidanan Poltekkes Kemenkes Yogyakarta

Telah selesai melakukan asuhan kebidanan berkesinambungan dalam rangka praktik kebidanan holistik Continuity of Care (COC) Asuhan dilaksanakan pada tanggal 12 Desember 2022 sampai dengan 02 Maret 2023 Judul asuhan: ASUHAN KEBIDANAN BERKESINAMBUNGAN (*CONTINUITY OF CARE/COC*) PADA NY. N USIA 28 TAHUN G2P1A0 UMUR KEHAMILAN 31 MINGGU DENGAN KEK PUSKESMAS TURI

Demikian surat keterangan ini dibuat dengan sesungguhnya untuk dipergunakan sebagaimana mestinya.






Yogyakarta, 12 Desember 2023



(Sri Suryanti, S.Tr.Keb.,Bdn)

DAFTAR HADIR PASIEN COC

Nama Mahasiswa : Suprihatin
NIM : P07124522090
Tempat Praktik : Puskesmas Turi
Nama Pasien : Nuriya Ayu Islami
Judul Kasus : Asuhan Berkesinambungan Pada Ny N Umur 28 Tahun
G2P1A0A01 32 minggu 4 hari dengan KEK di Puskesmas Turi

No	Hari/Tanggal	Tanda Tangan	Keterangan
1.	Selasa 20-12-2022		- Perkenalan dengan pasien dan keluarga, dan pendataan - Di lanjutkan pemeriksaan ANC
2.	Sabtu 24-12-2022		- kunjungan rumah ANC G2P1A0 U0 U0 32g, pemeriksaan pendataan layout
3.	Kabu 15-02-2023		- kunjungan rumah Nifas /K12 dengan keluhan puting susu lecet.
4.	Rabu 15-03-2023		- kunjungan rumah Nifas /K14 pp km' hui 58 - meli. sdr kb → kb suntik
5	Rabu 03-04-2023		- kunjungan ulang / kunjungan keluarga - Monev/evaluasi kunjungan

Sleman,

PEMERINTAH KABUPATEN Sleman
DINAS KESEHATAN
PUSAT KESEHATAN MASYARAKAT
TURI
Sri Suryahati, S.Tr.Keb.,Bdn

I. ASUHAN KEBIDANAN PADA MASA KEHAMILAN

Kunjungan Pertama

ASUHAN KEBIDANAN PADA KEHAMILAN NY.N, USIA 28 TAHUN,
G₂P₁AB₀AH₁, UK 32 MINGGU 4 HARI DENGAN KEK
DI PUSKESMAS TURI SLEMAN

Tanggal pengkajian : 20 DESEMBER 2022
Tempat : PUSKESMAS TURI SLEMAN
No. RM : -

Data Subyektif

1. Identitas

Biodata	Istri	Suami
Nama	: Ny. N	Tn. A
Umur	: 28 tahun	31 tahun
Pendidikan	: SMA	SMA
Pekerjaan	: IRT	Karyawan swasta
Agama	: Islam	Islam
Suku/ Bangsa	: Jawa/ Indonesia	Jawa/ Indonesia
Alamat	: Sukareja Girikerto Turi Sleman	

2. Alasan Kunjungan

Ibu mengatakan ingin memeriksakan kehamilannya.

3. Keluhan Utama

Ibu mengatakan merasa cemas menghadapi persalinan.

4. Riwayat Menstruasi

Menarche	: 12 tahun	Siklus	: 28 hari
Lama	: 7 hari	Teratur	: Teratur
Sifat Darah	: Cair (khas menstruasi)	Keluhan	: Tidak ada

5. Riwayat Perkawinan

Status pernikahan	: Menikah	Menikah ke	: Pertama
Lama	: 6 tahun	Usia menikah pertama kali	: 22 tahun

6. Riwayat Obstetrik : G₂P₁A₀Ah₁

Hamil Ke	Persalinan						Nifas		
	Tahun	Umur kehamilan	Jenis Persalinan	Penolong	Komplikasi	JK	BB Lahir	Laktasi	Komplikasi
1	2017	aterm	sc	dokter	Kala lama 1	P	2500		
2	Hamil ini								

7. Riwayat kontrasepsi yang digunakan

Ibu menggunakan KB Suntik 3 bulan

8. Riwayat Kehamilan sekarang

a. HPHT : 10-05-2022 HPL : 17-02-2023 Uk: 32 minggu 4 hari

b. ANC pertama usia kehamilan : 5 minggu 4 hari

c. Kunjungan ANC

No	TM	Frekuensi	Tempat	Keluhan	Terapi
1	I	2 kali	Puskesmas Turi	Pusing, mual	Asam folat, B6
2	II	7 kali	Puskesmas Turi dan PMB Wido	Tidak ada	Tablet tambah darah, Vitamin C, Kalsium
3	III	2 kali	Puskesmas Turi	Cemas menghadapi persalinan	Tablet tambah darah, Kalk

d. Imunisasi TT : TT 5 tahun (tahun 2021)

e. Pergerakan Janin dalam 12 jam (dalam sehari) : Lebih dari 10 kali

9. Riwayat Kesehatan

a. Ibu mengatakan tidak sedang/pernah menderita penyakit jantung, TBC, ginjal, DM. Ibu belum pernah menjalani operasi, dan tidak memiliki alergi apapun baik makanan maupun obat.

b. Ibu mengatakan dalam keluarga tidak ada yang sedang/pernah menderita penyakit jantung, hipertensi, asma, DM, ginjal, maupun TBC

10. Pola Pemenuhan Kebutuhan sehari-hari

Sebelum Hamil	Setelah Hamil
<p>a. Pola Nutrisi</p> <p>1) Makan</p> <p>Frekuensi : 3 x/hari</p> <p>Porsi : 1 piring</p> <p>Jenis : nasi, sayur, lauk</p> <p>Keluhan : tidak ada</p> <p>Alergi makanan : tidak ada</p> <p>2) Minum</p> <p>Frekuensi : 5-6x/hari</p> <p>Porsi : 1 gelas</p> <p>Jenis : air putih, teh</p> <p>Keluhan : tidak ada</p>	<p>2-3 x/hari</p> <p>1 piring</p> <p>Nasi, sayur, lauk</p> <p>Tidak ada</p> <p>Tidak ada</p> <p>Frekuensi : 8-9x/hari</p> <p>Porsi : 1 gelas</p> <p>Jenis : air putih, susu</p> <p>Keluhan : tidak ada</p>
<p>b. Eliminasi</p> <p>1) BAB</p> <p>Frekuensi : 1x/hari</p> <p>Konsistensi : Lunak</p> <p>Warna : Khas</p> <p>Keluhan : tidak ada</p> <p>2) BAK</p> <p>Frekuensi : 5-6x/hari</p> <p>Warna : Khas</p> <p>Keluhan : tidak ada</p>	<p>Frekuensi : 1x/hari</p> <p>Konsistensi : Lunak</p> <p>Warna : Khas</p> <p>Keluhan : tidak ada</p> <p>Frekuensi : 6-8x/hari</p> <p>Warna : Khas</p> <p>Keluhan : tidak ada</p>
<p>c. Istirahat</p> <p>Tidur Malam</p> <p>Lama : 6-7 jam/hari</p>	<p>7 jam/hari</p>
<p>d. Personal Hygiene</p> <p>Mandi : 2 x/hari</p> <p>Ganti pakaian : 2 x/hari</p> <p>Gosok gigi : 2 x/hari</p>	<p>2 x/hari</p> <p>2 x/hari</p> <p>2x/hari</p>
<p>e. Pemenuhan Seksualitas</p>	

Frekuensi	: 2-3 x/minggu	2x/minggu
Keluhan	: tidak ada	Tidak ada

f. Pola aktifitas (terkait kegiatan fisik, olah raga)

Ibu mengatakan selain bekerja juga melakukan pekerjaan rumah tangga di rumah.

11. Kebiasaan yang mengganggu kesehatan (merokok, minum jamu, minuman beralkohol)

Ibu mengatakan tidak mempunyai kebiasaan yang dapat mengganggu kesehatan seperti merokok, minum jamu, minuman beralkohol. Suami juga tidak merokok maupun minum minuman keras.

12. Psikososiospiritual:

Ibu dan suami sangat senang dengan kehamilan ibu. Kehamilan ini merupakan kehamilan yang pertama dan ibu sudah menantikan kehamilannya. Ibu sangat senang dengan kehamilannya karena tidak perlu menunggu lama untuk segera memiliki anak. Suami sangat mendukung ibu.

Ibu berhubungan baik dengan lingkungan sekitar.

Ibu beragama Islam dan beribadah sholat 5 waktu/hari.

Ibu berencana melahirkan di Puskesmas Kutoarjo

Ibu berencana merawat bayinya dengan dibantu oleh keluarga dan akan memberikan ASI eksklusif.

Ibu dan suami akan menggunakan BPJS saat melahirkan.

13. Pengetahuan ibu (tentang kehamilan, persalinan, dan laktasi)

Ibu mengatakan mengetahui tentang tanda-tanda persalinan.

14. Lingkungan yang berpengaruh (sekitar rumah dan hewan peliharaan)

Ibu mengatakan lingkungan di sekitar rumah bersih, dan ibu tidak mempunyai hewan peliharaan apapun.

Data Obyektif

1. Pemeriksaan Umum

Keadaan Umum : Baik

Kesadaran : Composmentis

Vital Sign

Tekanan Darah : 101/65 mmHg Nadi : 80x/menit
Pernafasan : 22 x/menit Suhu : 36.6 °C
Berat badan sekarang : 49.9kg Tinggi
badan : 149 cm
Berat badan sebelum hamil : 43 kg (IMT 17,4 kg/m²) LILA : 23 cm
Pertambahan berat badan 6 kg

2. Pemeriksaan Fisik

- a. Kepala : Bentuk mesocephal, tidak ada massa/benjolan.
- b. Muka : Bentuk oval, tidak ada oedema, terdapat cloasma gravidarum
- c. Mata : Bentuk simetris, konjungtiva pucat, sclera putih.
- d. Hidung : tidak ada polip, tidak ada infeksi.
- e. Mulut : Bibir lembab, tidak ada caries gigi
- f. Leher : tidak ada pembengkakan vena jugularis, tidak ada pembesaran kelenjar limfe
- g. Dada : Tidak ada ronkhi, tidak ada retraksi dada
- h. Payudara: simetris, tampak hiperpigmentasi areola, puting susu menonjol
- i. Abdomen : Tidak ada bekas luka, tidak terdapat linea nigra, terdapat striae gravidarum

Palpasi :

1) Leopold I

TFU pertengahan px fundus dan pusat teraba bagian bulat, lunak, tidak melenting (bokong)

2) Leopold II

Bagian kiri ibu teraba memanjang seperti papan, ada tahanan dan keras (punggung)

Bagian kanan ibu teraba kecil-kecil, banyak, (ekstremitas)

3) Leopold III

Bagian terendah janin teraba satu bagian bulat, keras, melenting (kepala), kepala sudah masuk PAP

4) Leopold IV

divergen, 4/5

TFU menurut Mc. Donald : 23 cm, TBJ : 1705 gram

Auskultasi DJJ : 152 x/menit, irama teratur kuat

j. Ekstremitas : tidak terdapat oedema baik pada tangan maupun kaki, ujung jari tidak pucat.

3. Pemeriksaan Penunjang Tanggal : 10 Desember 2022

Hb : 11,6gr/dl

Analisis Data

Seorang ibu Ny. N usia 28 tahun G₂P₁A₀Ah₁ uk 32 minggu 4 hari, janin tunggal, hidup, intra uteri presentasi kepala dengan KEK

DS : Ibu mengatakan berusia 28 tahun

Ibu mengatakan ini kehamilan pertama

Ibu mengatakan HPHT tanggal 10-05-2022

Ibu mengatakan cemas menghadapi persalinan

DO :

KU : baik

Kesadaran : composmentis

Vital sign

TD : 101/65 mmHg N : 80 x/menit

S : 36,6 °C RR : 22 x/menit

Px. Leopold :

1). Leopold I : TFU pertengahan pusat dan px, teraba bokong di fundus

2). Leopold II : Punggung kiri

3). Leopold III : Presentasi kepala

4). Leopold IV : divergen 4/5

DJJ : 136 X/menit, irama teratur, kuat

TFU mc Donald : 23 cm TBJ : 1705 gram

Masalah

KEK

anemia

Ibu merasa cemas menghadapi persalinannya yang semakin dekat

Identifikasi Diagnosa Potensial

Kala I lama

Perdarahan post partum

Asfiksia BBL

Antisipasi Tindakan Segera

Pemberian KIE tentang tanda, persiapan persalinan dan nutrisi dalam kehamilan.

Penatalaksanaan

1. Selama memberikan pelayanan kepada Ibu, Bidan selalu menggunakan APD lengkap dan memberikan pelayanan sesuai protokol kesehatan
2. Memberi tahu ibu berdasarkan hasil pemeriksaan yang dilakukan kondisi ibu dan janin baik
Evaluasi: Ibu mengatakan senang dan lega
3. Memberi konseling tentang keluhan yang dialami oleh klien, tanda bahaya kehamilan dan tanda-tanda persalinan serta persiapan menghadapi persalinan. Tanda persalinan meliputi: Timbulnya his persalinan ialah his pembukaan dengan sifat-sifatnya sebagai berikut: 1) Nyeri melingkar dari punggung memancar ke perut bagian depan, 2) Makin lama makin pendek intervalnya dan makin kuat intensitasnya, 3) Kalau dibawa berjalan bertambah kuat, 4) mempunyai pengaruh pada pendataran dan atau pembukaan cervix 5) *Bloody show* (Lendir disertai darah) 6) pecahnya kulit ketuban. Bila ibu menemui hal tersebut agar segera menghubungi petugas kesehatan. Persiapan persalinan meliputi tempat persalinan, penolong, perlengkapan ibu dan bayi, transportasi, pendamping dan dana. Tanda bahaya Ibu hamil trimester III meliputi keluar darah dari jalan lahir, demam, sakit kepala hebat disertai pandangan kabur, ibu tidak sadar. Disarankan ibu/keluarga harus segera menghubungi tenaga kesehatan.

Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan

4. Memberikan dukungan kepada ibu agar ibu tetap tenang dan menunggu tanda persalinan dirasakan, karena jika ibu khawatir dan cemas maka akan menghambat hormone yang melepaskan reaksi persalinan
Evaluasi: Ibu mengatakan sedikit tenang.
5. Memberikan motivasi ibu untuk rutin melaksanakan senam ibu hamil di rumah agar persalinan bisa berjalan dengan lancar.
Evaluasi: Ibu mengatakan akan melakukan senam hamil di rumah
6. Menganjurkan kepada ibu untuk merendam kaki di air hangat sehari 3 kali selama 30 menit untuk relaksasi dan mengurangi kecemasan.
Evaluasi: Ibu mengatakan akan mencoba
7. Memberi KIE pada ibu tentang anemia dan konseling pemberian tablet Fe 1x1 sehari yaitu:
 - a) Minum zat besi diantara waktu makan atau 30 menit sebelum makan, karena penyerapan berlangsung lebih baik ketika lambung kosong.
 - b) Menghindari mengkonsumsi kalsium bersama zat besi (susu, antasida, makanan tambahan prenatal), karena akan menghambat penyerapan zat besi dalam tubuh.
 - c) Mengkonsumsi vitamin C (jus jeruk, jambu, tambahan vitamin C), karena dapat digunakan untuk meningkatkan absorpsi zat besi non heme (berasal dari tumbuhan).⁹¹
 - d) Bisa juga minum tablet besi bersama dengan madu karena maduEvaluasi: Ibu mengatakan mengerti dan akan menghabiskan obat yang diberikan.
8. Menganjurkan ibu untuk melakukan kunjungan ulang 10 hari lagi atau jika ibu ada keluhan.
Evaluasi: Ibu mengatakan mengerti dan akan kontrol ulang bila obat habis.
9. Mendokumentasikan hasil tindakan yang dilakukan

Catatan Perkembangan Kehamilan

Pertemuan Ke II

Tanggal pengkajian : 24 Desember 2022

Tempat : Rumah Pasien

No. RM :

Data Subyektif

Pada tanggal 24 Desember 2022 jam 15.30 WIB, bidan datang berkunjung ke rumah Ny. N, untuk mengadakan pendampingan dan pemeriksaan kehamilan, dan pada saat kunjungan pasien tersebut mengatakan tidak ada keluhan tentang kehamilannya.

Riwayat Menstruasi : Menarche Usia 12 tahun, siklus 28 hari, lamanya 7 hari, teratur, sifat darah khas, keluhan tidak ada.

HPHT : 10-05-2022 HPL: 17-02-2023

Uk : 32 minggu 4 hari

Riwayat Obstetri : G₂P₁A₀Ah₁

1. Hamil ini

Riwayat Kesehatan : Tidak ada riwayat penyakit jantung, hipertensi, asma, DM, ginjal, maupun TBC dalam keluarga.

Riwayat Psikososial : Ibu merasa lebih siap menghadapi persalinan karena sudah merasa kenceng-kenceng perutnya

Data Obyektif

KU : Baik

Kesadaran : CM

TD : 101/65 mmHg

RR : 22 x/menit

HR : 80 x/menit

T : 36.5⁰c

Palpasi abdomen: Teraba bokong di fundus uteri, puki, presentasi kepala, divergen 4/5 (Mc. Donald = 23 cm)

Auskultasi : 152x/ menit teratur

Analisis

Seorang ibu Ny. N usia 28 tahun G₂P₁A₀Ah₁ uk 32 minggu 4 hari, janin tunggal, hidup, intra uteri, presentasi kepala, bpd (belum dalam persalinan)

Penatalaksanaan

1. Selama memberikan pelayanan kepada Ibu, Bidan selalu menggunakan APD lengkap dan memberikan pelayanan sesuai protokol kesehatan

2. Memberi tahu ibu dan suami hasil pemeriksaan, ibu dan janin baik, ibu belum dalam persalinan.

Evaluasi: Ibu dan suami mengatakan mengerti penjelasan yang diberikan.

3. Memberi tahu ibu kencang-kencang yang dialami ibu masih merupakan his palsu menjelang trimester akhir kehamilan. Kontraksi atau his yang adekuat adalah his yang datang secara teratur, yakni 3-4x dalam 10 menit lamanya 30-40 detik.

Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan

4. Memberi penjelasan lagi kepada ibu tentang tanda-tanda persalinan, yaitu : kencang-kencang teratur pada perut semakin lama semakin sakit, keluarnya lendir darah dari jalan lahir dan keluarnya air ketuban.

Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan.

5. Menganjurkan kepada ibu untuk memantau gerakan janin. Gerakan janin dapat menjadi penanda kesejahteraan janin dalam kandungan. Gerakan janin yang aktif atau baik adalah minimal 10 kali gerakan dalam waktu 12 jam. Bila gerakan janin kurang dari 10 kali dalam 12 jam, maka ibu harus segera memeriksakan kondisi janin ke fasilitas kesehatan terdekat.

Evaluasi: Ibu mengatakan memahami penjelasan yang diberikan

6. Memberikan dukungan kepada ibu agar ibu tetap tenang dan menunggu tanda persalinan dirasakan, karena jika ibu khawatir dan cemas maka akan menghambat hormone yang melepaskan reaksi persalinan. Bila ibu tenang, maka persalinan akan terjadi.

Evaluasi: Ibu mengatakan merasa tenang dan semangat

7. Memberi terapi Ibu tablet tambah darah 1x1 selama 7 hari dan menganjukan ibu menghabiskan tablet tambah darah.

Evaluasi: Ibu mengatakan mengerti dan akan menghabiskan obat yang diberikan

8. Memberi tahu kepada ibu jadwal kunjungan ulang yakni pada 1 minggu yang akan datang atau bila ada keluhan.

Evaluasi: Ibu mengatakan setuju dengan jadwal kunjungan ulang.

9. Memberi tahu ibu kalau dengan persalinan Riwayat operasi SC maka persalinan selanjutnya dengan cara operasi SC. 1 minggu sebelum HPL dating ke puskesmas untuk mendapat surat rujukan ke Rumah sakit.

II. ASUHAN KEBIDANAN PADA IBU BERSALIN

Tanggal : 6 Februari 2023

Data Subyektif

Ibu WA bidan mengatakan kenceng-kenceng secara teratur sejak jam 21.00 WIB. Jam 24.00 WIB keluar air ketuban dirumah. Ibu sampai di RSUD Sleman jam 01.30.. Di RS Ibu mengatakan advise Dokter Ny. N, akan dilakukan persalinan dengan cara operasi SC besok pagi. Tanggal 7 Februari 2023 jam 04.24 WIB bayi lahir menangis beberapa saat setelah lahir. BB 2745 gr, PB 47,5 cm. Kemudian bayi mendapat perawatan di Ruang Bayi. Ny. N setelah melahirkan dalam kondisi sehat, namun tidak melakukan IMD dalam 1 jam pertama kelahiran. Pemantauan persalinan dan nifas pertama dilakukan dengan media whatsapp.

Analisis :

Ny. N umur 28 tahun P2A0 Ah12 post partum dengan tindakan operasi sc persalinan atas indikasi re sc

Masalah: Kecemasan ibu karena bayinya mengalami gangguan pernapasan.

Penatalaksanaan :

1. Memberikan dukungan dan support mental kepada ibu dengan mengucapkan selamat atas kelahiran anaknya dan turut bergembira
Evaluasi: Ibu senang dengan kelahirannya.
2. Memberi penjelasan kepada ibu bahwa kondisi bayi ibu akan segera membaik karena sudah ditangani oleh tenaga yang profesional dan kolaborasi dengan Dokter spesialis anak. Ibu dianjurkan untuk bersabar dan tidak perlu khawatir.
Evaluasi: Ibu mengatakan mengerti penjelasan yang diberikan dan merasa agak tenang.
3. Mengajarkan untuk mobilisasi dini yaitu dengan latihan miring kanan dan kiri, kemudian dilanjutkan dengan latihan duduk

Evaluasi: Ibu belajar menyusui bayinya

4. Menganjurkan kepada ibu untuk minum air putih 2-3 liter/hari, dan menghabiskan porsi makan yang disediakan.

Evaluasi: Ibu mengatakan memahami penjelasan yang diberikan.

III. ASUHAN KEBIDANAN PADA IBU NIFAS

Pengkajian :

Askeb Ibu Nifas Hari Ke-8

Pengkajian

Tanggal : 15-02-2022

Jam : 12.00 WIB

Data Subyektif

Keluhan Utama

Ibu mengatakan sudah cukup sehat, dapat beristirahat, ASI sudah keluar banyak, tapi puting susu payudara sebelah kanan mengalami lecet sehingga ibu merasa nyeri saat menyusui.

Data Obyektif

1) Keadaan Umum

Keadaan umum : Baik

Kesadaran : Composmentis

2) Tanda-tanda vital

Tensi : 110/70 mmHg

Nadi : 84x/menit

Suhu : 36,9⁰celcius

RR : 20x/menit

3) Pemeriksaan Obstetri

Mammae : membesar, puting susu menonjol, hiperpigmentasi areola, ASI (++), puting susu payudara kanan lecet dan kemerahan.

Abdomen : TFU 2 jari diatas simpisis, kandung kemih kosong, kontraksi uterus keras.

Genetalia : lochea sanguinolenta, tidak berbau busuk, terdapat luka pada perineum, kering, baik, kulit sudah menyatu. PPV \pm 5 cc.

Analisa

Ny.N umur 28 tahun P2A0Ah2, pot sc hari ke 8 dengan puting susu lecet

Penatalaksanaan

1. Memberitahu ibu bahwa hasil pemeriksaan baik, TD : 110/70 mmHg, TFU 2 jari diatas simpisis, kandung kencing kosong dan pengeluaran pervaginam berupa flek flek darah,dengan jumlah yang normal
Evaluasi: Ibu mengatakan senang mengetahui hasil pemeriksaan baik,dan dalam kondisi normal.
2. Memberi penjelasan pada ibu tentang penyebab terjadinya lecet pada payudara ibu yaitu karena teknik menyusui yang kurang benar.
3. Menganjurkan ibu untuk selalu cuci tangan sebelum menyentuh bayi.
4. Memberi KIE pada Ibu tentang teknik menyusui yang benar dan mempraktekkan langsung pada bayi.
 - a. Memperhatikan posisi bayi
 - 1) Kepala bayi dan badan bayi harus dalam satu garis yaitu bayi tidak dapat mengisap dengan mudah apabila kepalanya bergeser atau melengkung
 - 2) Muka bayi menghadap payudara dengan hidung menghadap puting yaitu seluruh badan bayi menghadap badan ibu
 - 3) Ibu harus memegang bayi dekat pada ibu.
 - 4) Apabila bayi baru lahir, Ibu harus menopang bokong bukan hanya kepala dan bahu merupakan hal yang penting untuk bayi baru lahir.
 - b. Memberi tahu tanda bayi menyusu dengan efektif adalah:

- 1) Bayi terbuka matanya lebar-lebar seperti menguap, dengan lidahnya ke bawah dan kedepan persis sebelum ia merapatkan mulutnya di payudara
- 2) Ia menarik puting dan sebagian besar areola masuk kedalam mulutnya
- 3) Dagunya meleku pada payudara ibu dan hidungnya menyentuh susu ibu
- 4) Bibirnya dipinggir dan lidahnya menjulur diatas gusi bawahnya
- 5) Rahangnya bergerak secara ritmis ketika bayi disusui
- 6) Bayi mulai disusui dengan singkat dan cepat. Begitu susu mengendur, ia menyelesaikan ke dalam corak yang lambat dengan penuh susu dan jeda waktu yang singkat.⁸³

a. Memberi KIE tentang perawatan payudara yang benar yakni

- 1) Tidak membersihkan puting dengan sabun, alkohol, atau zatiritan lainnya. Pada puting susu dapat dioleskan ASI sebelum dan selesai menyusui dan biarkan mengering sebelum memakai BH
- 2) Menyusui lebih sering (8-12 kali dalam 24 jam) sehingga payudara tidak sampai terlalu penuh
- 3) Selain itu juga perawatan puting susu yang lecet sementara puting susu yang lecet tidak digunakan untuk menyusui/istirahat selama sedikit-dikitnya selama 24 jam. Peras ASI dari payudara yang lecet. Jika perlu pada waktu meneteki mempergunakan alat pelindung puting susu. Peras ASI dari payudara yang lecet bila setelah disusu.
- 4) Menggunakan BH yang menyangga.

b. Memberi KIE tentang cara meningkatkan produksi ASI, ibu disarankan untuk sering mengkonsumsi daun katuk. Selain daun katuk, Ibu juga bisa mengkonsumsi temu lawak. Menurut Kemenkes cara mengkonsumsi temulawak untuk meningkatkan produksi ASI yaitu bahan ramuan : Temulawak 7 iris, Meniran 1/2 genggam, Pegagan 1/4

genggam, Air 3 gelas. Cara pembuatan yaitu mencampurkan semua bahan kemudian direbus dalam air mendidih selama 10 sampai 15 menit dengan api kecil. Diminum 2 kali sehari, pagi dan menjelang tidur malam. Selain dengan cara itu, suami Ny N juga bisa mendukung Ibu dalam meningkatkan produksi ASI yaitu dengan cara akupressur. Titik akupressur yang disarankan menurut Kemenkes adalah dilakukan pemijatan pada perpotongan garis tegak lurus dari sudut kuku bagian kelingking. Lokasi yang terletak 4 jari di bawah tempurung lutut di tepi luar tulang kering.



Gambar 1. Lokasi akupressur

10. Memberi KIE pada Ibu tentang nutrisi selama menyusui.

Kebutuhan gizi selama menyusui meliputi:

a) Karbohidrat

Saat 6 bulan pertama menyusui, kebutuhan ibu meningkat sebesar 65 gr per hari atau setara dengan 1 ½ porsi nasi.

b) Protein

Sangat diperlukan untuk peningkatan produksi air susu. Ibu menyusui membutuhkan tambahan protein **17 gr** atau setara dengan 1 porsi daging (35 gr) dan 1 porsi tempe (50gr).

c) Lemak

Kebutuhan minyak dalam tumpeng gizi seimbang sebanyak 4 porsi atau setara dengan 4 sendok the minyak (**20 gr**). Lemak yang diperlukan untuk ibu menyusui yaitu lemak tak jenuh ganda seperti omega-3 dan omega-6

d) Vitamin yang penting dalam masa menyusui adalah vitamin B1, B6, B2, B12, vitamin A, yodium & selenium. Jumlah kebutuhan vitamin & mineral adalah 3 porsi sehari dari sayuran dan buah-buahan.

e) Ibu menyusui sangat membutuhkan cairan agar dapat menghasilkan air susu dengan cepat. Dianjurkan minum 2-3 liter air per hari atau lebih dari 8 gelas air sehari (12-13 gelas sehari). Terutama saat udara panas, banyak berkeringat dan demam sangat dianjurkan untuk minum >8 gelas sehari.

f) Waktu minum yang paling baik adalah pada saat bayi sedang menyusui atau sebelumnya, sehingga cairan yang diminum bayi dapat diganti. Kebutuhan cairan dapat diperoleh dari air putih, susu, jus buah-buahan dan air yang tersedia di dalam makanan.

IV. ASUHAN KEBIDANAN PADA BAYI BARU LAHIR USIA 8 HARI

Tanggal : 15-02-2023 pkl: 12.30 WIB

Identitas Bayi

Nama : Bayi Ny. N

Tanggal/ Jam Lahir : 07-02-2023/ 04.24 WIB

Jenis kelamin : Perempuan

Data Subyektif

1) Riwayat Persalinan Sekarang

Ibu mengatakan melahirkan secara SC persalinan atas indikasi re SC pada tanggal 7 Februari 2023 pukul 04.24 WIB. Persalinan ditolong oleh dokter, jenis kelamin Perempuan, berat badan 2745 gram, panjang badan 47 cm, lingkar kepala 30 cm. Bayi lahir menangis beberapa saat, mendapat terapi O2 dan mendapat perawatan di RSUD Sleman selama 3 hari

2) Pola Pemenuhan Kebutuhan Sehari-Hari

a) Pola Nutrisi

Bayi segera setelah lahir tidak dilakukan IMD. Saat ini bayi hanya minum ASI.

b) Pola Eliminasi

Bayi sudah BAB sehari 1kali normal dan BAK 8-10 kali.

c) Pola Istirahat

Bayi masih sering tidur. Tidur malam 10 jam, tidur siang sekitar 8 jam.

d) Pola Hygiene

Bayi dimandikan sehari 2 kali, dibersihkan kemaluannya dan diganti popoknya setiap selesai BAK dan BAB.

Data Obyektif

1) Pemeriksaan Fisik

Pemeriksaan Umum

Keadaan umum: bayi sehat, gerakan aktif, menangis kuat, tonus otot baik

Vital Sign

Denyut Jantung : 130x/menit Suhu : 37⁰ C RR : 60x/menit

Pengukuran Antropometri

BB : 2750 gram Lingkar Kepala/LK : 30 cm

PB : 47 cm Lingkar Dada/ LD : 31 cm

2) Pemeriksaan fisik

Kepala : Mesocephal, tidak ada caput suksedanum, tidak ada cephal hematoma

Mata : Konjungtiva merah muda, sclera putih

Hidung : tidak terdapat pernapasan cuping hidung

Leher : Tidak ada pembengkakan vena jugularis

Dada : tidak ada retraksi dada, tidak ada stridor maupun ronkhi

Abdomen : Tidak ada pembesaran pada perut, tali pusat sudah puput.

Genitalia : testis telah masuk ke dalam skrotum, tidak ada hipospadia

Kulit : Ikterik fisiologis kramer 1

Analisis

Bayi. Ny. N, neonatus hari ke-8 fisiologis.

Penatalaksanaan

1. Memberitahukan ibu bahwa dari hasil pemeriksaan bayinya sehat.
Evaluasi: Ibu mengatakan senang mengetahui keadaan bayinya sehat.
2. Menganjurkan kepada ibu untuk memberikan ASI dan menyusui bayi sesering mungkin, karena semakin sering menyusui maka semakin banyak prolaktin dan ASI yang dikeluarkan sehingga bayi sehat dan dapat tumbuh optimal. Ibu sebaiknya memberikan ASI saja tanpa tambahan apapun termasuk air putih dan susu formula selama 6 bulan atau ASI eksklusif, dan meneruskan pemberian ASI dengan tambahan MP-ASI (makanan pendamping ASI) hingga anak berusia 2 tahun.
Evaluasi: Ibu mengatakan bersedia untuk menyusui bayinya secara eksklusif.
3. Memberi KIE tentang imunisasi BCG dan menganjurkan ibu untuk mengimunisasikan bayinya sebelum usia 3 bulan, memantau pertumbuhan dan perkembangan anak dengan melakukan penimbangan setiap bulan di posyandu, dan melakukan stimulasi perkembangan pada Anak
Evaluasi: Ibu mengatakan dapat memahami penjelasan yang diberikan.

V. ASUHAN KEBIDANAN KELUARGA BERENCANA

Tanggal Pengkajian : 15 Maret 2023 jam 15.30

Data Subyektif

Pemantauan nifas selanjutnya menggunakan media whatsapp yaitu post partum hari ke 36, Ibu mengatakan dirinya dan bayi dalam keadaan sehat, tidak ada keluhan terhadap kesehatannya. Ibu mengatakan akan menggunakan KB suntik bila nifas sudah selesai. Ibu memilih KB suntik disebabkan merasa tertarik karena Ibunya dulu menggunakan KB suntik dan cocok. Ny. N berencana menunda kehamilan selama 5 tahun ke depan dan mempunyai 2 orang anak saja.

Riwayat persalinan : Ibu bersalin pada tanggal 7 Februari 2023 jam 04:24 WIB secara SC a.i RE SC ditolong oleh dokter SpOG di RSUD Sleman Bayi lahir dengan berat badan 2745 gram/ PB 47,5 cm/ LK 30 cm. Kondisi ibu dan bayi sehat.

Analisis

Ny. N umur 28 tahun P2A0 Ah2 , post partum hari 38

Penatalaksanaan :

1. Memberikan informasi kepada ibu tentang metode kontrasepsi selama menyusui yang dapat ibu pilih. Ibu dapat menggunakan kondom, KB pil, suntik 3 bulanan, IUD, dan implan. Ibu juga dapat menggunakan metode alamiah yakni MAL (Metode Amenorea Laktasi), pantang berkala, suhu basal, maupun kalender. Setiap metode kontrasepsi mempunyai efektifitas yang beragam dalam mencegah kehamilan.

Evaluasi: Ibu memutuskan untuk menggunakan KB suntik 3 bulan.

2. Melakukan konseling kepada Ny. N tentang kontrasepsi suntik 3 bulan yang menjadi pilihan ibu. Konseling yang diberikan pada ibu meliputi pengertian, manfaat, efek samping, dan kegagalan. Konseling yang diberikan pada Ny. N adalah bertujuan untuk meningkatkan keefektifan individu dalam pengambilan keputusan secara tepat.

Evaluasi: Ibu mengatakan akan suntik KB setelah masa nifas selesai.

LAMPIRAN LAMPIRAN

Foto Ibu

	IBU	SUAMI/KELUARGA
NAMA	Nuriya Agul Istiami	Andi Bambang Idris
NIK	3310224207940001	
PEMBIAYAAN		
NO. JKN:	0000560188078	
FASKES TK 1:	TURI	
FASKES RUJUKAN:		
GOL. DARAH	B	
TEMPAT	Sukarjo	Sukarjo
TANGGAL LAHIR	02 Juni 1999	9 November 1991
PENDIDIKAN	SMA	SMA
PEKERJAAN	IRT	Kary. Swasta
ALAMAT RUMAH	Sukarjo, RT 01/01	
TELEPON	085 74363160	
PUSKESMAS DOMISILI:	TURI	
NO. REGISTER KOHORT IBU:		

Disisi oleh petugas kesehatan

Hermina Hidi Traktor jatin, tanggal 10.5.2022
Her Taster Pradono jatin, tanggal 11.2.2023
Lupita Lupa Her, tanggal 11.2.2023
Coklatin Dahi, tanggal 11.2.2023
Rogmanan Komsari jatin, tanggal 11.2.2023
Rivald Pradono jatin, tanggal 11.2.2023

Alamat lengkap: Sukarjo, RT 01/01, Desa Sukarjo, Kecamatan Sukarjo, Kabupaten Sukarjo, Jawa Tengah 50111

Diisi oleh petugas kesehatan

Hermina Hidi Traktor jatin, tanggal 10.5.2022
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No	Uraian	Tgl	Waktu	Tempat	Tempat	Tempat	Tempat	Tempat	Tempat
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Alamat lengkap: Sukarjo, RT 01/01, Desa Sukarjo, Kecamatan Sukarjo, Kabupaten Sukarjo, Jawa Tengah 50111









Iron Deficiency Anemia in Pregnancy: Novel Approaches for an Old Problem

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Outcome; Prenatal Care.

ABSTRACT

Iron needs increase exponentially during pregnancy to meet the increased demands of the fetoplacental unit, to expand maternal erythrocyte mass, and to compensate for iron loss at delivery. In more than 80% of countries in the world, the prevalence of anemia in pregnancy is > 20% and could be considered a major public health problem. The global prevalence of anemia in pregnancy is estimated to be approximately 41.8%. Undiagnosed and untreated iron deficiency anemia (IDA) can have a great impact on maternal and fetal health. Indeed, chronic iron deficiency can affect the general wellbeing of the mother and leads to fatigue and reduced working capacity. Given the significant adverse impact on maternal-fetal outcomes, early recognition and treatment of this clinical condition is fundamental. Therefore, the laboratory assays are recommended from the first trimester to evaluate the iron status. Oral iron supplementation is the first line of treatment in cases of mild anemia. However, considering the numerous gastrointestinal side effects that often lead to poor compliance, other therapeutic strategies should be evaluated. This review aims to provide an overview of the current evidence about the management of IDA in pregnancy and available treatment options.

The overall iron requirement during pregnancy is significantly greater than in the non-pregnant state, despite the temporary respite from iron losses incurred during menstruation. Iron needs increase exponentially during pregnancy to meet the increased demands of the fetoplacental unit, to expand maternal erythrocyte mass, and to compensate the iron loss at delivery.¹⁻³ In more than 80% of the countries in the world, the prevalence of anemia in pregnancy is > 20% and could be considered a major public health problem. The global prevalence of anemia in pregnancy is estimated to be approximately 41.8%.⁴

The fact that iron deficiency anemia (IDA) frequently develops in pregnancy even in developed countries indicates that the physiologic adaptations are often insufficient to meet the increased requirements, and iron intake is often below nutritional needs.⁵ Undiagnosed and untreated

IDA can have a great impact on maternal and fetal health. Indeed, chronic iron deficiency can affect the general wellbeing of the mother and leads to fatigue and reduced working capacity. It can also cause pallor, breathlessness, palpitations, headaches, dizziness, and irritability. There is evidence to suggest a significant correlation between the severity of anemia, premature birth and low birth weight, intrauterine growth restriction, low neonatal iron status, preeclampsia, and post-partum hemorrhage,^{6,7} similarly to what occurs for other pregnancy-related diseases.⁸⁻¹⁸

Epidemiology and etiology of anemia

Anemia is a global health problem that affects approximately one-third of the world's population. Anemia affects roughly 2 billion people.^{19,20} In 2010, the years of life lived with disability due to anemia amounted to 68.4 million, an increase from 65.5 million years in 1990. During this time frame (1990–

2010), the prevalence rate of anemia decreased from 40.2% to 32.9%, but more for males.²¹ Although the causes of this disorder are different, including hemoglobinopathies, micronutrient deficiencies (such as folate, vitamin B12, and riboflavin), schistosomiasis, parasites, acute and chronic infections, and chronic kidney disease,^{20,22} the World Health Organization (WHO) estimates that iron deficiency accounts for 50% of cases.¹⁹

In most instances, IDA occurs in areas with chronic malnutrition (50–80%); nevertheless, iron deficiency conditions without anemia are also a common health problem in developed countries (up to 20%).²² The prevalence of iron deficiency may vary according to different conditions, as it occurs with other nutritional deficiencies.^{23–28} Women and young children are more at risk of IDA; this disorder prevails in infancy (47%), pregnant women (42%), and women of reproductive age (30%).²⁹

Iron deficiency anemia in women of reproductive age

In 2011, 29% (496 million) of non-pregnant women and 38% (32.4 million) of pregnant women aged 15–49 years were anemic, of which about 20 million had severe anemia.³⁰ Although IDA is most frequent in low-income countries, recent data show that 40–50% of European non-pregnant women have low iron body stores.³¹ Women are known to have a much higher iron deficiency prevalence compared to men of the same age; the prevalence rate is about 10-times higher than males. This difference is mostly due to regular blood loss during menstruation, which is often associated with low iron intake.^{32,33} Adolescent girls are particularly vulnerable to this condition because of the elevated iron request for rapid growth, and menstrual blood loss.^{34,35} Furthermore, several conditions can play a determinant role in favoring insufficiency of iron in women, such as chronic gynecologic bleeding due to uterine fibroids,^{36–38} endometriosis,^{39–44} adenomyosis, or endometrial hyperplasia. Moreover, intestinal malabsorption problems, frequent blood donation, and benign and malignant gastrointestinal lesions are other causes of IDA in women.^{32,33,45}

Clinical impact of iron deficiency in women

Iron is an essential element involved in various physiological functions and cellular activities. It

represents a cofactor for many enzymes, and it is involved in the oxygen transport by hemoglobin (Hb) in red blood cells and also in different cellular processes, including DNA synthesis and oxidation-reduction reactions.⁴⁶ Furthermore, animal models have suggested a role for iron in brain development and function. Inadequate iron levels determine a decrease of enzyme function and low red blood cell production with a consequent reduction of oxygen supply to tissues. Because of these effects, iron deficiency and IDA can cause a wide range of physical and cognitive effects.^{45,46} The clinical presentation of iron deficiency/IDA is often characterized by various symptoms that include fatigue, irritability, weakness, hair loss, and poor concentration and work performance based on the severity of the condition.⁴⁷

Iron deficiency anemia in pregnant women

IDA is a frequent condition during pregnancy. The global prevalence of anemia in pregnancy is estimated to be approximately 41.8%;⁴ nevertheless, the percentage of iron deficiency without anemia is unknown. The overall iron requirement during pregnancy is significantly higher than in the non-pregnant state, despite the temporary respite from iron losses incurred during menstruation. This is due to an exponential increase of iron needs to expand the plasma volume, produce a greater quantity of red blood cells, support the growth of fetal-placental unit, and compensate for iron loss at delivery.^{1–3} The physiological iron demand in pregnant women corresponds roughly to 1000–1200 mg for an average weight of 55 kg. This quantity includes almost 350 mg associated with fetal and placental growth, about 500 mg associated with expansion in red cell mass, and around 250 mg associated with blood loss at delivery. In the course of gestation, iron need presents a variation with a growing trend; in fact, there is a lower iron necessity in the first trimester (0.8 mg/day) and a much higher need in the third trimester (3.0–7.5 mg/day). At the beginning of pregnancy, approximately 40% of women show low or absent iron stores, and up to 90% of women have iron reserves of < 500 mg, which represent an insufficient amount to support the increased iron needs.^{48,49} An overt IDA frequently develops in pregnancy even in developed countries, indicating that the physiologic adaptations are often insufficient to meet the increased requirements,

and iron intake is often below nutritional needs. IDA in pregnancy, if not diagnosed and treated, can have a significant impact on maternal and fetal health.⁵

Maternal and fetal consequences of iron deficiency anemia

Pregnant women with IDA show various symptoms, including pallor, breathlessness, palpitations, hair loss, headaches, vertigo, leg cramps, cold intolerance, dizziness, and irritability. IDA can also lead to reduced thermoregulation, fatigue, poor concentration, reduced working capacity, decreased maternal breast milk production, and maternal iron stores depletion during the postpartum period.^{7,19} Furthermore, the risk of postpartum depression is significantly increased in comparison with pregnant women without iron deficiency; fatigue and depression, due to anemia, may negatively influence the mother-child relationship.⁵⁰⁻⁵² In addition, pregnant women with IDA have an increased risk of developing complications such as increased susceptibility to infections, cardiovascular insufficiency, eclampsia, higher risk of hemorrhagic shock, or need of peripartum blood transfusion in cases of heavy blood loss. The risk of maternal mortality has a direct correlation with the severity of IDA.⁵³

IDA is associated with increased risks of low birth weight and preterm delivery, especially in cases that iron deficiency occurs in the first and second trimester of pregnancy. However, in other cases of anemia, a small increase of these risks has been highlighted. Conversely, in pregnant women during the third trimester, the risk of preterm delivery is markedly attenuated. The increase of preterm delivery in pregnant women is also related to the severity of anemia. In cases of moderate or severe anemia, the risk is roughly doubled, whereas in mild anemia it is raised by approximately 10–40%.⁵⁴

IDA during pregnancy can lead to placental problems, death in utero, infections, and low iron stores in newborns.^{7,55} Iron plays a vital role as a cofactor of enzymes and protein involved in the processes of development of the central nervous system. Therefore, iron deficiency might be associated with significant consequences. Indeed, early iron deficiency alters morphology and metabolism of brain cells, has a negative impact on oligodendrocytes altering myelination,

and compromises neurotransmission. For all these reasons, iron deficiency increases the risk of poor cognitive, motor, social-emotional performances, and interferes with neurophysiologic development.^{56,57}

Diagnosis of anemia during pregnancy

The definition of anemia recommended by the Centers for Disease Control and Prevention is “a Hb or hematocrit (Hct) value less than the fifth percentile of the distribution of Hb or Hct in a healthy reference population based on the stage of pregnancy”.⁵⁸ Current classification lists the following levels as anemic: Hb (g/dL) and Hct (percentage) levels below 11 g/dL and 33%, respectively, in the first trimester; 10.5 g/dL and 32%, respectively, in the second trimester; and 11 g/dL and 33%, respectively, in the third trimester.⁵⁸ Because of the numerous adverse consequences on maternal and fetal health that IDA causes during pregnancy, early diagnosis is essential.

Laboratory evaluation is fundamental for a definitive diagnosis of iron deficiency and IDA. As the etiology of anemia includes various causes, the diagnosis cannot be based only on Hb values. For diagnostic clarification, it is necessary to evaluate red blood count and serum ferritin (SF) levels. The most reliable parameter to reveal iron deficiency is SF, and screening of SF concentration at the beginning of pregnancy is recommended.⁵⁹ If SF is < 30 g/L, there is a high probability that iron stores are depleted, even in the absence of anemia. A SF value < 30 g/L is associated with an Hb concentration < 11 g/dL during the first trimester, < 10.5 g/dL during the second trimester, and < 11 g/dL during the third trimester are diagnostic for IDA in pregnant women.⁶⁰ Iron therapy should be considered in such cases. However, in the presence of inflammatory processes or chronic diseases, ferritin levels can be falsely normal or elevated, despite the presence of anemia. This is because ferritin reacts as an acute-phase protein. The evaluation of C-reactive protein (CRP) levels may assist in obtaining the correct diagnosis, excluding infections or inflammation. If the CRP value is elevated, re-evaluation of the SF level is recommended after the normalization of CRP concentration. Repeating SF levels measurement afterward during pregnancy is not necessary if the patient does not show symptoms of anemia. Conversely, Hb concentration should be measured in each trimester. When ferritin levels

are ≥ 30 g/L, apart from measuring CRP levels, it is necessary to carry out other diagnostic investigations such as the determination of transferrin saturation and serum iron.^{55,60-62}

If the level of ferritin is normal, a serum transferrin value $< 15\%$ proves a latent iron deficiency because more iron is released from blood circulation by transferrin to ensure erythropoiesis. Serum iron levels are susceptible to fluctuation diurnal, intra- and inter-individual, so, usually, the assessment of serum iron and transferrin levels helps in diagnosis, though the SF represents the right tool.⁵³

Another parameter that could be useful to detect iron deficiency during pregnancy, in the case of normal ferritin values and elevated CRP, is transferrin receptor (sTfR). It shows an increase in cases of iron deficiency or greater iron cellular demand. During pregnancy, the increase of sTfR values is related to increased stimulation of erythropoiesis and a major iron requirement due to iron-dependent cell proliferation. Low concentrations of sTfR in the first period of pregnancy seem to be associated with an inhibited erythropoiesis in the first trimester, as some studies have shown. Moreover, sTfR concentration is not influenced by infections or inflammatory reactions.^{53,62}

For the differential diagnosis with other causes of anemia, such as hemoglobinopathies, infections, or chronic kidney disease, further investigations are needed. In particular, Hb electrophoresis or chromatography is indicated to exclude genetic diseases such as β -thalassemia. In cases of megaloblastic anemia, vitamin B12 should be measured since vitamin B12 deficiency is a common condition. Folic acid deficiency anemia, instead, is less frequent.^{53,61}

Treatments of anemia during pregnancy

PROPHYLAXIS

There is poor evidence about the effect of iron prophylaxis in pregnancy in determining a reduction of global iron deficiency prevalence and, consequently, a decrease of maternal and fetal complications. Therefore, the risk and benefit of preventive iron supplementation are debated.^{63,64} The WHO promotes daily iron supplementation during pregnancy for women who live in areas with a high prevalence of iron deficiency because the administration of prophylactic iron in women with low iron stores represents a significant benefit.⁶⁵

Nevertheless, iron prophylaxis is also used in industrialized countries.

The right dosage for prophylactic iron supplementation is unclear; current guidelines indicate 60–120 mg elemental iron/day.⁶⁵ Lower doses show no effect; instead, dosages ≥ 120 mg/day involves an increase of unwanted side effects and consequently lead to poor compliance.⁵⁵

TREATMENT

The choice of the correct treatment of anemia depends on its cause and severity. The time remaining until delivery, the severity of anemia, additional risks, maternal comorbidity, and patients' wishes are important factors that must be considered when deciding the therapeutic approach.⁶⁶ The routes of iron administration include oral and parenteral ones. Parenteral iron therapy is indicated in pregnancy from the second trimester onwards. The most appropriate parenteral route is the intravenous; intramuscular iron therapy is generally not recommended because intramuscular iron absorption is slow and, in addition, intramuscular injections are painful and can be associated with some inconveniences such as the development of sterile abscesses. Moreover, this route of iron administration is not less toxic or safer than the intravenous one.⁶⁰

ORAL IRON

Oral iron administration represents the first line of management recommended in pregnancy in case of mild IDA and iron deficiency without anemia. The different oral iron formulations are iron (II) salts, iron (III) polymaltose complex, and liposomal iron.^{3,61}

IRON (II) SALTS

Three ferrous iron salts are available: ferrous sulfate, ferrous gluconate, and ferrous fumarate. None of them seems better than the others, and they show comparable rates of side effects.⁶⁷

The standard is to prescribe elemental iron daily at doses of 100–200 mg to women with IDA.⁴⁷ A dose of iron supplementation below 100 mg/day is currently considered inadequate by several authors.⁶¹ Ferrous salts present low and variable absorption rates. Their absorption can be limited by mucosal luminal damage as well as by the ingestion of certain foods; so, it is indicated that administration one hour before meals on an empty stomach with a glass of orange juice or another form of vitamin C to favor absorption.⁶⁸ Nevertheless, it is still unclear whether weekly or intermittent administration of

oral iron is equivalent to daily administration.⁶⁹ Follow-ups should be performed after 2–4 weeks to evaluate the effectiveness of the treatment. After the normalization of the Hb values, oral iron administration should be continued for at least another 4–6 months until a ferritin level of roughly 50 ng/mL, and transferrin saturation of at least 30% have been obtained.⁵³

IRON (III) POLYMALTOSE COMPLEX

One of the few available oral iron (III) compounds is the iron (III) polymaltose complex (IPC) dextriferron. It belongs to the class of slow-release preparations; the polymaltose, acting as an envelope around the trivalent iron, allows a slower iron release from the complex, with a consequent reduction of the rate of side effects, compared with iron salts. Furthermore, its bioavailability is increased when taken with meals. The dose recommended is 100–200 mg/day. Compared to iron salts, IPC has equal effectiveness but a superior safety profile, as some studies have shown.⁷⁰ There are only a few studies related to the use of iron polymaltose (IP) during pregnancy, but no serious adverse events have been reported so far.⁷¹

LIPOSOMAL IRON

Liposomal iron, a preparation of ferric pyrophosphate associated with ascorbic acid and conveyed within a phospholipid membrane, is a new-generation oral iron that shows a high bioavailability and a low incidence of side effects, due to lack of any direct contact with the intestinal mucosa.^{3,72} Minimal data are available about its use during pregnancy.³

INTRAVENOUS (IV) IRON

Oral iron therapy can be switched to IV therapy in some clinical conditions such as a weak or absent response to oral iron, low absorption due to intestinal disease, intolerance of oral iron, lack of compliance, or the need for rapid and adequate treatment (bleeding due to placenta praevia, advanced gestational age, etc).^{61,66}

Previous formulations of IV iron were responsible for undesirable and sometimes severe side effects such as anaphylaxis, shock, and death that led to their limited use. Conversely, the new type of iron complexes developed in the last years guarantees a higher efficacy, safety, and better compliance. The use of iron dextran has been limited in pregnancy due to the high rate of adverse reactions, even serious ones. No severe adverse effects have been shown with the use of iron gluconate; however,

this approach is not very practical as it requires multiple infusions with high healthcare costs and reduced patient compliance.⁶⁹ The maximum single dose is 125 mg. It has low molecular stability and is not indicated for use during the first trimester.⁶⁰ As the IV iron bypasses intestinal iron absorption and the link to protein binding, it represents an optimal alternative to oral iron therapy. The new formulations bind iron more tightly to the carbohydrate core, so favoring a decrease of free iron released, which is toxic. Free iron leads to cell and tissue damage due to peroxidation, as it causes the production of reactive oxygen species such as hydroxide and oxygen radicals; therefore, the severe consequences related to free iron are limited. The most recent products of IV iron allow the use of high doses in a single administration.⁷³

Different IV iron formulations are recommended for the treatment of IDA such as ferric carboxymaltose (FCM), iron sucrose (IS), and IP.⁷⁴

IRON SUCROSE

IV IS complex shows a side effect profile better than oral iron, and is safe and efficacious in pregnancy.⁷⁵ Studies show an increase of the Hb concentration in 28 days from 1.3 to 2.5 g/dL compared with 0.6 to 1.3 g/dL in the groups treated with oral iron.⁵³ The maximum dose in a single administration should not exceed 200 mg. The infusion time should be at least 15 minutes for 100 mg and 30 minutes for 200 mg.⁶⁰

IRON POLYMALTOSE

IV IP shows significant effectiveness in terms of improvements in hematological parameters. Yet, it is associated with elevated rates of adverse reactions such as headache, symptomatic hypotension, back pain, heartburn, chest tightness, dyspnea, nausea, tachycardia, rash, and vomiting.^{76,77} For IP, the maximum dose in a single administration may be over 2500 mg. The infusion time for the maximum dose is approximately 4–5 hours.⁷⁴

FERRIC CARBOXYMALTOSE

FCM, Ferinject[®] is the first-choice preparation in cases in which IV iron therapy is recommended in pregnancy. FCM presents high molecular stability. In several randomized studies, Ferinject was found a safe and effective IV iron product in pregnancy and also presented a low percentage of undesirable side effects compared to oral iron. Furthermore, FCM does not cross the placenta.^{53,60,61,78} The maximum

daily dose is 1000 mg/20 mL. The administration rate should be 100–500 mg/min. Administration time is a minimum of 15 minutes for doses of 500–1000 mg.⁶⁰

DISCUSSION

Because of the remarkable impact of IDA on maternal and fetal health, iron therapy is strongly recommended. The effectiveness of iron supplement for the treatment of iron deficiency is documented by clinical trials involving pregnant women.⁷⁹

The use of liposomal iron might represent a promising strategy of oral iron treatment in pregnant women with IDA. This compound shows a high gastrointestinal absorption and bioavailability and a low incidence of side effects. Therefore, liposomal iron presents good tolerability and favors better compliance than iron salts.^{3,72}

In pregnancy, a frequent alternative treatment to oral iron, when it is not indicated, is IV iron. The new formulations of IV iron therapy promote a higher, as well as faster, increase of Hb concentration and SF levels than oral iron supplementation, as was already shown in different studies.^{60,61} In comparison to oral iron, FCM guarantees a more rapid correction of anemia and also an evident improvement of quality life with a lower rate of symptoms such as fatigue and depression. It also presents higher tolerability and, consequently, greater compliance than oral iron. As the carbohydrate moiety binds the elemental iron more tightly, high doses of FCM (about 1000 mg in a single administration with a short infusion time) are allowed, thus guaranteeing an improvement in compliance and an abatement of costs due to repeated administrations. Compared to IS, FCM shows greater effectiveness and a comparable rate of safety profile, despite the dosage in a single administration is much higher. On the contrary, the maximum dose of IS in a single administration should not exceed 200 mg doses, because the sucrose portion binds elemental iron less tightly.^{53,60,61,78}

In the last decades, new formulas with a higher bioavailability and fewer side effects have been promoted. Liposomal vesicles have drawn the attention of researchers as potential carriers of various bioactive molecules that could be used for therapeutic applications in humans and animals.

Several commercial liposome-based drugs have already been discovered, registered, and introduced with great success on the pharmaceutical market.⁸⁰

Liposomal iron, a preparation of ferric pyrophosphate associated with ascorbic acid and conveyed within a phospholipid membrane, is a new-generation oral iron which shows a high bioavailability and a low incidence of side effects, due to lack of any direct contact with intestinal mucosa.^{3,72}

Encapsulation of iron in a micronized form in liposomes represents a new promising strategy for oral iron therapy, and it is associated with better gastrointestinal absorption, higher bioavailability, and a lower incidence of side effects.¹³

Liposomal carriage favors lesser exposure to gastric contents and allows targeted delivery and the administration of lower doses due to direct absorption into the bloodstream without the need for protein carriers.⁸¹

The use of lower doses of liposomal iron proves to be effective compared to usual doses of ferrous sulfate. During pregnancy, liposomal iron significantly increases Hb and ferritin values, as suggested by clinical evidence. This guarantees to reduce the gastrointestinal adverse effects associated with non-capsulated conventional oral iron. Therefore, liposomal iron presents good tolerability and favors better compliance than iron salts.^{3,72}

CONCLUSION

IDA in pregnancy is a public health problem. Given the significant adverse impact on mother and fetus outcomes, early recognition and treatment of this clinical condition are fundamental. IV iron represents a common alternative treatment, in case of oral iron intolerance or poor compliance, and the new formulations of IV iron show a good safety profile and high effectiveness. IV iron administration is associated with some drawbacks, such as the necessity to move to the hospital and the loss of working hours. Liposomal iron seems to be a promising new strategy of iron replacement. It is effective and well-tolerated, thus ensuring greater compliance.

Disclosure

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